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The New Method in Diabetes

The New Method in Diabetes

The Practical Treatment of Diabetes as Conducted at the
Battle Creek Sanitarium, Adapted to Home
Use, Based Upon the Treatment of More
Than Eleven Hundred Cases

J. H. KELLOGG, M. D., LL. D.

Chief Medical Director of the Battle Creek Sanitarium, Author of "Neurasthenia—Its Causes and Cure," "Colon Hygiene," "Rational Hydrotherapy," "The Art of Massage," "Light Therapeutics," "The Hygiene of Infancy," etc.

Battle Creek, Michigan
GOOD HEALTH PUBLISHING CO.
1917

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Preface

Diabetes has long been regarded as an incurable disease and the methods of treatment employed, except in the hands of a few highly trained experts, have yielded very little in the way of satisfactory results. Within recent years, however, the metabolism studies conducted in various European laboratories, as well as researches carried on in this country by Lusk, Benedict, Joslyn, Allen, Woodyatt and others, have made progress possible; but the greatest advance has been made through the discoveries of Guelpa of Paris. Progress has also been made as the result of the large clinical experience in the treatment of this disease which has been developed through hospital and sanitarium practice. Many new, as well as old, methods have been tried and found wanting. The merits of a few methods of real value have been demon-

42468

strated and improved upon. The accumulated experience gained in the treatment of over 1200 cases of this disease, under most favorable conditions for constant and complete control and observation, has finally led to the development of a system of treatment and management which it is one purpose of this booklet to set forth in some detail. The work is especially designed to meet the needs of trained nurses, and of intelligent persons who have the misfortune to suffer from this disorder, and who desire to prepare themselves to make a vigorous fight against it.

There is no form of disease in which an intelligent knowledge of the nature of his malady may be of so much benefit to the sick man as in a case of diabetes. Indeed, such knowledge is absolutely indispensable to the patient to enable him to protect himself against the special dangers to which the sufferer from diabetes is exposed. Special instruction is also necessary to enable the patient to properly regulate his regimen, since it is not always possible to have at hand the services of an expert who is trained in catering to the needs of the diabetic patient.

The diabetic patient also needs to be taught how to observe the leading and characteristic symptoms of his malady so that he may be able to detect any new exacerbation, such as the reappearance or increase of sugar or of acidosis.

Still another purpose of this work has been to supply a variety of wholesome and suitable recipes as a basis for a varied and appropriate dietary. It is believed that the special chapter devoted to recipes herein presented will meet this long existing need more fully than has heretofore been done. All the recipes presented have been tested in the feeding of many diabetic patients and have been found satisfactory.

The methods recommended are no longer experimental; they have been so long and so thoroughly tested that their value is established. Under the regimen recommended the diabetic seldom fails to become "urine sugar free" in three or four days, and when the methods suggested are faithfully carried out, the urine is easily kept sugar free in practically all cases—with very rare exceptions.

The writer desires especially to acknowledge his obligation for these excellent recipes as well as for assistance in working out the details of the standard bills-of-fare to Miss Lenna F. Cooper, Director of the Battle Creek Sanitarium School of Home Economics and to Miss Corinne King, the Head Dietitian of the Sanitarium.

Wholly disavowing any attempt to present in this little work an exhaustive treatise on the subject of diabetes, the writer nevertheless ventures to express the hope that it may prove to be of practical service to trained nurses and to those sufferers from diabetes into whose hands it may fall.

The New Method in Diabetes

What Is Diabetes?

In diabetes the nutritive functions of the body are disturbed in such a way that the ability to utilize carbohydrates, starch, dextrine and sugar, is largely lost. In many cases the tissues are also unable to utilize protein and fat in a normal way.

Food Is Fuel

And a diabetic patient may be compared to a furnace which has insufficient draft. The crippled furnace may be able to burn a small amount of fuel well, but when the usual amount of fuel is put into it, the combustion is incomplete; some of the unburned fuel escapes through the chimney as smoke, another portion of the unburned fuel remaining in the furnace as cinders.

Soot accumulates in the chimney and the cinders clog the grates, so that the furnace is still further crippled and is able to burn less and less fuel. If the crippled condition of the furnace is ignored and coal is added at the usual rate, the fire will finally be completely smothered and will die out.

In a diabetic patient the analogy holds good in every particular.

The Day's Ration

The body of a healthy man consumes each day food having a fuel value equivalent to about 2,500 calories. (See page 76). Twenty-five hundred calories will raise 10,000 pounds of water one degree in temperature, or 100 pounds of water 100 degrees. If burned in a furnace instead of in the body, the quantity of food named, 2,500 calories, will produce the amount of heat indicated.

More than half of the total food intake consists of carbohydrate (starch and sugar).

Sugar the Chief Source of Energy

The average man consumes about one pound of sugar a day; most of it is in the form of starch, which is converted into sugar in the body by the process of digestion.

Scientific research has shown that sugar (not cane sugar, but fruit sugar and sugar formed by digestion from starch and dextrine) is the form of fuel best adapted to the human body. Sugar is easily burned and the products of combustion are non-poisonous (CO_2 and water) and are easily and quickly eliminated.

Fat is burned when sugar is absent or deficient in quantity.

Protein, represented by the white of egg, the lean of meat and the gluten of wheat, is the poorest of all food fuels. It is now generally admitted that the chief use of protein is to repair the machinery of the body, that is, to replace worn-out tissues, muscles, glands, nerves, etc. Of a given quantity of protein eaten only a little more than half can be utilized as fuel; the other half is in part used for repair of the essential tissues, the balance being converted into waste and poisonous substances, which are discharged through the kidneys.

The Nature of Diabetes

When a person is unable to properly utilize the carbohydrate of his food, a portion or even in grave cases the whole, may appear in the urine as sugar. Such urine has a sweetish taste and the sugar may be separated from it in crystalline form.

In advanced cases of diabetes in which the ability to utilize fats is lowered or largely lost, very highly poisonous acid substances derived from the fats appear in the urine. These are known to the chemist as *acetone, diacetic acid* and *beta oxybutyric acid.* The presence of these acids indicates a serious condition of the patient.

The diabetic patient differs from a

healthy person in another particular. When a normal person eats more sugar or fat than he requires to maintain the heat and energy of his body, the surplus is deposited beneath the skin and in other parts of the body in the form of fat which is thus a reserve or residual tissue. Almost an unlimited quantity of fat may thus be accumulated. Many obese persons carry about surplus fat equal to their normal weight or even more.

Glycogenic Function Impaired

A healthy person is also able to store up a considerable amount of sugar in the form of animal starch or glycogen. All the body cells store some glycogen but the chief depots are in the liver and the muscles. A healthy liver may store at one time a half pound of sugar.

In the diabetic the ability to convert sugar into fat and to store sugar in the liver and muscles in the form of glycogen is impaired and may be almost wholly lost.

How a Diabetic Differs From a Healthy Person

The diabetic differs, then, from a healthy person in the following very definite particulars:

1. The ability to utilize starch and sugar is impaired.

2. The ability to store fat and sugar is decreased.

3. The ability to utilize food of any sort is lessened.

Restrictions to Which Diabetics Must Submit

With the foregoing facts in mind it is clear that every diabetic must submit to certain very definite restrictions, especially the following:

1. He must carefully avoid taking more food than is absolutely necessary, and must in fact accustom himself to a meager diet, taking less than is usually required by a per-

son in health having the same weight and leading an ordinary active life.

2. Since his ability to assimilate food is lessened, the diabetic must restrict his expenditure of energy in his work in proportion.

3. The diabetic must limit the amount of sugar and starch which he eats in proportion to his ability to utilize these food principles. It must be remembered, however, that a certain amount of carbohydrate is essential, and that the general health will suffer very seriously if the amount of carbohydrate is for a long period reduced to much less than 60 grams per diem (two ounces or 240 calories). The extended researches of Zellner showed that the minimum amount of carbohydrate is 1 part by weight to 4 parts of fat, or 1 calory of carbohydrate to 9 calories of fat. This amount of carbohydrate is absolutely necessary to enable the body to utilize the fat without acidosis. More carbohydrate is necessary for good health.

4. In general, diabetics are able to utilize fats fairly well even when starches and sugars are very badly tolerated; hence the diet of the diabetic must contain more fat than the normal diet, but excess must be avoided.

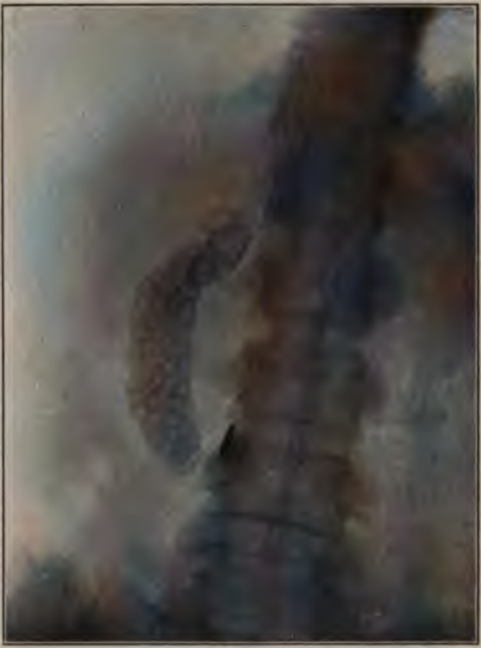
5. Protein must be used sparingly to avoid over-taxing the greatly overworked excretory organs. Meats are especially harmful.

6. Patients who are overweight should reduce their weight.

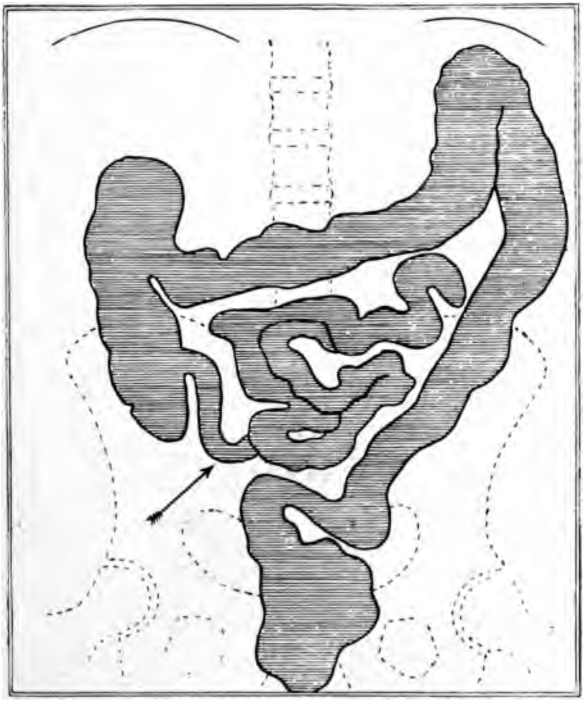
The Cause of Diabetes

The cause of this disease has long been regarded as obscure. Many theories have been advanced. At the present time, most authorities are agreed that diabetes is usually associated with disease of the pancreas.

Recent observations have shown that there is a definite connection between disease of the gall-bladder, especially gallstones, and diabetes. Gallstones are known to be due to infection. In a number of cases sugar has disappeared from the urine after re-



Gall Stones



Incompetent Ileocecal Valve

moval of gallstones or drainage of the gall-bladder. Disease of the gall-bladder leads to pancreatitis which is relieved by drainage.

Diabetes is known to be associated with certain nervous diseases, certain diseases of the liver, the thyroid and the hypophysis, an organ located at the base of the brain.

In the writer's experience, heredity has appeared to be a factor in nearly one-fourth of all cases observed.

There are good grounds for believing that diabetes may be one of the numerous consequences of chronic intestinal toxemia. Diabetics nearly always give a history of chronic constipation. An *x*-ray examination usually shows incompetency of the ileocecal valve and stasis or stagnation in the ileum. These conditions lead to infection of the gall- bladder and the pancreas, and thus induce diabetes.

The free use of meat, by encouraging intestinal toxemia, especially when associated with constipation, may be reasonably suspected of being a prominent factor in the production of diabetes.

It is believed that the excessive use of cane sugar may be a cause of diabetes.

Is Diabetes Curable?

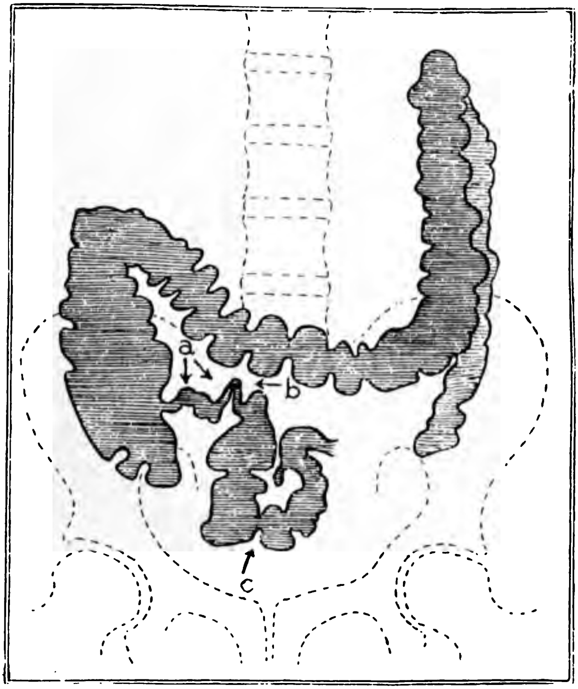
For many years, and until recently, diabetes has been regarded as an incurable disease.

The great success which has attended the new methods of treatment affords ground for hope of cure in many cases which were formerly abandoned as hopeless. At the present time it may be safely said as regards cure or improvement that:

1. The progress of the disease may be checked and the patient's condition improved in practically every case of diabetes.

2. The urine may be made sugar free and the disease may be arrested and its progress stayed for an indefinite time, even many years, in the great majority of cases.

3. In a limited number of cases the dis-



Ileac Stasis

ease may not only be arrested and the urine made sugar free, but by the careful and persevering application of scientific methods the ability to utilize sugar and other foodstuffs may be largely restored and the patient brought back to a condition that is nearly normal.

The writer has observed a number of cases in which the restoration to health has been so complete that the patient has been able to return to an ordinary diet without the appearance of sugar in the urine, all traces of the disease having disappeared.

Essential Features of the New Method

The new method aims to accomplish several very essential things which by other methods were not done at all, or were very imperfectly done.

1. *The new method determines the extent to which the patient's metabolism or nutritive functions are disturbed by means of a careful examination.*

A Thoroughgoing Examination

Diabetes is a disease of metabolism; that is, it is a disorder in which the intricate processes of tissue change and activity by which the body develops the various forms of energy which it manifests, including animal heat, are disturbed. By means of an ingenious apparatus which has been perfected in recent times, it is now possible to make so exact a study of the body as to determine in each case of diabetes exactly the extent to which the metabolism is disturbed, and thus to determine at once the degree of gravity of the case.

It is highly important that such a study should be made in every case at the beginning of a course of treatment. By knowing the exact condition of the patient at the start, the character and extent of existing defects, it is possible to note with accuracy the changes which may occur for better or worse.

An Exact and Scientific Regimen

2. *The new method establishes a definite regimen for the patient which is scientifically adapted to his condition and needs.*

By continuing the careful study of the patient's metabolism in connection with proper measures of treatment and scientific feeding, it is possible to establish a regimen for practically all patients, by the careful following of which the urine may not only be made sugar free, but kept free.

Reducing the Blood Sugar

3. *The new method removes the immediate cause of the urinary sugar by reducing the excess of sugar in the blood.*

Since the sugar of the urine is only an overflow from the excess of sugar in the blood, the sugar of the blood should be determined by blood analysis, and the sugar content of the blood should be brought down to as nearly normal as possible. That the excess of blood sugar may be made to disappear has been demonstrated in many cases.

Increasing the Ability to Utilize Starch and Sugar

4. *The new method increases the tolerance for carbohydrates.*

In every case when possible the carbohydrate tolerance must be increased, and the dietary brought as near to the normal standard as possible, although in most cases the carbohydrate intake must always remain much below the ordinary. This is accomplished by special management of the diet. The old method lessened the ability of the patient to utilize carbohydrates (starch and sugar) until finally the amount utilized became so small that the needs of the body were not met and the bodily functions so deranged that loss of flesh, strength, appetite and vital resistance steadily progressed to final acidosis and death. The new method leads to opposite results. It increases the ability to use starch and sugar, secures a gain in strength and vital stamina, and almost certainly insures the patient against the danger of acidosis and diabetic coma so long as he adheres strictly to the instructions given.

Special Training and Education

5. *The new method trains and educates the patient so that he may watch his symptoms intelligently and so regulate his own diet as to keep his urine sugar free.*

In recent times, methods of examination have been perfected by means of which the patient may be so educated that he will be able to watch his case intelligently, and regulate his diet scientifically. This requires that the patient should be taught to make such tests of the urine from day to day, or at longer intervals, as will enable him to detect the presence of sugar and of the harmful fatty acids which lead to diabetic coma. A description of these tests is given later also methods of regulating the food intake.

Every person who has become diabetic must make such a study of his disease that he can watch and interpret his symptoms correctly, and such a study of food and dietetics as will enable him to intelligently regulate his diet. The watching of symptoms by the patient is in most diseases highly undesirable; but in diabetes it is imperatively necessary for safety and success.

One of the most distinctive features of the new method is the employment of short fasts as a means of freeing the urine from sugar. Until recently, fasting was supposed to be highly dangerous in cases of diabetes. When a healthy person fasts, a condition of acidosis develops within a few hours. This is a state in which certain poisonous fatty acids and other toxic substances appear in the blood and the urine. In grave cases of diabetes, acidosis is present and is likely to develop to such a pronounced degree as to cause coma and finally death. Since fasting produces acidosis in a healthy person, it was natural to suppose that in diabetes the effect of fasting would be to increase the acidosis already present and thus induce diabetic coma.

A most fortunate observation made by Guelpa of Paris, and reported by him in a paper read before the British Medical Association in 1910, showed this to be an error. In fact, fasting diminishes instead of increases acidosis in diabetes and so is not injurious. This was clearly demonstrated by Guelpa, and later by Allen of the Rockefeller Institute, Joslin of Boston and others, and in a large number of cases treated at the Battle Creek Sanitarium where the Guelpa method has been employed since 1912.

Guelpa discovered that by means of a short fast the urine may be made free from both sugar and the poisonous acids which indicate the presence of acidosis. This is one of the most important and useful discoveries which has ever been made in relation to the treatment of diabetes. The fasting method is commonly known as the Allen method, but as a matter of fact the discovery was made by Guelpa of Paris, who has practiced the method for many years.

By a fast of two or three days, rarely longer, the urine may be made sugar free in practically every case of diabetes. If the urine does not become quite free from sugar after two or three days, carefully restricted feeding is resumed and the fast is repeated after an interval of a few days.

By repeated fasts, the amount of sugar will be gradually lessened until finally the urine will be made sugar free.

These fasts should always be undertaken, at least at first, under the supervision of a physician. When possible, a physician who has made himself familiar with the new methods should be selected. After several experiences, the intelligent patient who interests himself in the study of his case will become able to manage his own regimen successfully, taking an occasional fast when needed.

Modern Methods for the Exact Scientific Study of Diabetes

For the careful study of a case of diabetes the entire quantity of urine passed each day must be collected and submitted to careful quantitative examination.

Every morsel of food must be weighed or measured and the value in calories for each day recorded.

The patient's weight should be determined daily and always at the same hour, preferably before breakfast and before taking food or drink.

The determination of the acidosis by examination of the residual respired air should be made at least once a week.

The stools should be carefully examined at the beginning of treatment and afterward at frequent intervals, to make sure that the flora is changed and intestinal toxemia eliminated.

When possible, a careful examination of the entire alimentary canal should be made by means of the *x*-ray and the bismuth meal, especially for the purpose of determining the condition of the duodenum, small intestine, ileocecal valve, colon and gall-bladder, and of locating the stasis which is very likely to be found present in either the large or small intestine, or both of these organs.

The Metabolism Graphic

(In pocket in cover.)

So far as possible, every patient suffering from diabetes should have the advantages of institutional treatment for a sufficient length of time to secure a careful study of his case and the determination of his carbohydrate balance, and the establishment of a regimen by means of which the urine may be kept free from sugar, and the tolerance for carbohydrate gradually increased.

In the institutional study and management of a case of diabetes great assistance is rendered by the Metabolism Graphic, a method by which the whole history of each case since beginning treatment is kept constantly before the physician. An understanding of the important facts shown by the graphic will enable the patient to appreciate the importance of this thoroughgoing method of study of cases of this sort, and will also serve to impress upon his mind the necessity for thorough and conscientious co-operation with the physician in his efforts to combat a disease which, without the employment of the thoroughgoing and efficient measures which have been developed in recent years, must be regarded as hopeless and incurable.

The Metabolism Graphic summarizes and presents in a form easy of comprehension the following data, all of which are essential to a full understanding of any case of diabetes: *The coefficient of sugar utilization, the hyperglycemia or per cent of increase of blood sugar, the carbohydrate balance, the degree of acidosis, the tissue balance, the energy* *balance, the water balance, the acidosis as shown by the tension of the* CO_2 *of the alveolar air determined through examination of the breath, the per cent of increase of metabolism, the respiratory quotient, the food intake, the patient's weight and his "base ration."*

A few words in explanation in relation to each of these items will aid in an understanding of their significance and their importance and value to the physician.

The Amount of Urine

In diabetes, the urine is practically always increased in quantity and in proportion to the amount of sugar present; hence, a patient can judge something of his condition by the amount of urine passed. For scientific purposes, the urine is estimated in cubic centimetres. Thirty cubic centimetres equal one ounce. The amount of urine is, of course, also influenced by the amount of water and the quantity of food taken. On fast days, the urine is often diminished in quantity notwithstanding the considerable amount of liquid taken. This is the natural result of the rapid lessening of the urinary sugar.

The Urinary Sugar

The amount of sugar in the urine is determined by means of chemical tests and the use of an instrument known as the polariscope. The quantity is estimated in grams. Twenty-eight and four-tenths grams equal one ounce avoirdupois.

The graphic shows the actual amount of sugar eliminated in the urine for each twenty-four hours. As the patient improves, the curve on the graphic which indicates urinary sugar steadily drops until the zero line is reached, which shows that the sugar has disappeared from the urine.

The Coefficient of Sugar Utilization

In health, all the sugar taken with the food in the form of sugar, starch, or protein, is utilized, none appearing in the urine. In diabetes, at least a portion of the sugar of the food remains not utilized and is eliminated through the kidneys. The more severe the type of the disease, the larger the proportion of food sugar lost through the urine. In grave cases all the sugar taken in the food is eliminated and sometimes the amount of sugar found in the urine is greater even than the entire intake, showing that the body tissues have been broken down. The graphic shows at once the percentage of sugar which has been utilized and if the body tissues are being broken down. The sugar derived from this source is likewise shown. In health, the curve indicating the coefficient of sugar utilization should coincide with the line marked 100 and should run straight across the page without deviation. When the curve drops, the cause is the reappearance of sugar. If the curve falls below the zero line, this fact is an indication that sugar is being derived from the destruction of the body tissues, a condition which cannot exist long without the gravest results.

The coefficient of sugar utilization is obtained thus: To the total carbohydrates of the diet, expressed in grams, is added one-half the weight of the protein intake; from this is subtracted the urinary sugar; the remainder is divided by the total food sugar. The result will be the per cent of the total intake of carbohydrate which has been utilized. If there is no urinary sugar whatever, this result will, of course, be 1.00 or one hundred per cent, and the curve will rise to the line marked 100.

Hyperglycemia

The meaning of this term is excess of sugar in the blood. The blood normally contains, very constantly, one-tenth of one percent or one part of sugar in one thousand of blood. The cells of the body are constantly bathed with this sugar solution and are nourished by it. In diabetes, the blood sugar is very greatly increased and may rise to several times the normal amount and becomes an irritant and injury to the tissues. In determining the blood sugar, a small amount of blood is removed from a vein with a hypodermic syringe. By means of a delicate test recently perfected, it is possible to ascertain with great accuracy the per cent of sugar present. The amount found is compared with the normal and the per cent is indicated on the chart, the right hand cipher being omitted. The normal is located at the line 100.

Acidosis

The most serious danger which threatens the diabetic patient is the development in the blood and tissue fluids of highly poisonous acids, and perhaps other substances derived from the imperfect burning of fats. The presence of these substances is indicated in the urine by the increase of acetone and the presence of diacetic acid and other fatty acids. The test for the presence of these substances is given elsewhere. When these acids make their appearance, nature undertakes to prevent the disastrous effects likely to result therefrom by producing ammonia, which being an alkaline substance serves as a chemical antidote. It is generally possible to determine with a sufficient degree of accuracy the amount of dangerous acids present, or the degree of acidosis, by noting the increase of ammonia in the urine. As the urinary ammonia increases, the acidosis rises. With the decrease of ammonia, the acidosis curve falls. The acidosis almost invariably disappears very soon after the urine becomes sugar free.

Acidosis by CO_2 Tension of the Alveolar Air

Alveolar air is the air found in the deepest parts of the lungs. By CO_2 tension is meant the proportion of carbon-dioxide in the air. The proportion of CO_2 in the air cells of the lungs has been shown to correspond with that in the blood. In acidosis, the presence of acids in the blood lessens the amount of carbon-dioxide which the blood can take up from the tissues; hence the proportion of carbon-dioxide found in the residual air of the lungs falls. The normal minimum is about thirty-five per cent. This point is indicated by a red line running across the graphic.

The farther the curve falls below this point the greater the degree of acidosis. The higher the curve rises above the line, the farther removed is the patient from the danger of acidosis. If the tension of the alveolar air falls below twenty-five, coma is threatening. Only the application of efficient measures will save the patient. A few days' or even a few hours' delay under such circumstances may lead to a fatal result. In the face of these facts the importance of this test will be appreciated.

The Tissue Balance

This coefficient is based upon the fact that the body is unable to store up protein to any considerable amount. Carbohydrates and fat may be converted into adipose tissue and in this way stored; but protein, if not used, must be quickly removed from the body. By careful estimation of the amount of protein introduced in the food and the amount lost through the stools and the urine, it is possible to determine to what extent protein is being utilized, that is, being built into the essential tissues, or whether the body is losing protein through the destruction of the muscles and the other superior tissues of the body. For example, if the food contains fifty grams of protein, whereas the body loses through the urine and stools one hundred grams, the meaning is that the body tissues are being torn down. This is very likely to occur in grave cases of diabetes, in which the amount of sugar as well as the amount of protein lost through the urine is often much greater than that supplied by the food.

During fasting, while the patient is on a low diet, there will necessarily be some destruction of tissue, and the tissue balance curve will fall below the zero line. When a regimen has been established which the patient can safely follow for an indefinite length of time, the tissue balance curve will appear on the graphic just above, or near, the zero line. After a prolonged period of abstinence or low diet, the tissue balance often rises high above the zero line when the tissue loss is being made up by a liberal intake of protein. This coefficient is of great value in fixing the protein content of the dietary and hence must be closely watched while the regimen is being worked out in each individual case.

The Energy Balance

The body consumes food as a furnace consumes fuel. The combustion of food is the source of the body heat and of all forms of bodily energy. Muscular exercise especially is accompanied by the consumption of a large amount of food material, chiefly in the form of sugar. The action of the heart and other bodily organs constantly requires the expenditure of a considerable amount of energy which is likewise derived from the food. Each heart beat consumes about 1-1000 of a calory. During fasting, the adipose tissue of the body, the fat, and afterward the muscles and other superior tissues may be destroyed to support the bodily activities.

The amount of food necessary to meet the requirements of the body in a state of absolute rest has been designated by the physiologists as the "base ration." By extended research, the base ration for the average healthy man has been found to be about twenty-five calories per kilogram, or eleven and one-half calories per pound. This amount must be increased, however, by twenty-five per cent to provide for a small amount of muscular activity, as it is not found necessary even during the fasting period to keep the patient in a state of absolute rest; and so, for practical purposes, the base ration is fixed at fourteen calories per pound of body weight. It should be stated, however, that the figures used represent not the weight actually shown by the scales in the individual case, but the normal weight for a person of the same height as shown by the accompanying table. (See page 76.)

In determining the energy balance, the food intake of the individual for each day is compared with his base ration, and the percentage of excess or deficiency is indicated on the chart. So long as the patient is kept upon a low diet, the energy balance will necessarily fall considerably below the central or zero line of the chart, and the coefficient or energy balance will be negative. In the case of obese diabetics, a negative energy balance must be maintained for a considerable period so as to lessen the patient's weight. This has been shown to be highly important. In the case of a very fat diabetic, sugar will often disappear as soon as the weight is brought down to near the normal limit. When a patient is greatly emaciated, it is desirable to gradually increase the energy balance always taking care to keep the urine sugar free.

The energy balance generally tallies very well with the fluctuations of the body weight. A positive energy balance usually means a gain of tissue; a negative balance, a loss of tissue. However, this is not always the case. A gain of weight may be due to an accumulation of water which often occurs in diabetes, while there may be at the same time a loss in fat or even of muscle tissue.

By careful observation of the energy balance and the tissue balance the physician is enabled to get an insight into the changes taking place deep down in the recesses of the tissues, and to discover the beginnings of destructive processes which, if neglected, might lead to great injury through the tearing down of the body tissues.

It can be readily seen that it cannot be a matter of indifference to the patient whether a gain in weight is due to an accumulation of fat or an increase of muscular tissue, or merely an accumulation of water which may be the result of a failure of the kidney functions. This is especially true when the patient is permitted to take salt in liberal quantities. The overworked kidneys often refuse to eliminate all the salt which is taken with the food. Each ounce of salt retained in the body requires the retention of seven or eight pounds of water to hold it in solution. A single dram of salt, if retained, will increase the weight of the patient one pound. Such a gain of weight may be a disadvantage instead of an advantage, and may be the first indication of failure of the kidneys to perform their function, a very natural result of the enormous amount of work which these organs are made to do in case of diabetes.

The Water Balance

While under scientific observation, every diabetic should be required to measure carefully and report the amount of water, milk and other liquid foods taken during each twenty-four hours. The urine must also be carefully collected and the quantity determined in connection with the consumption of sugar and other necessary determinations. In addition to the water taken in the form of liquids, a considerable amount is represented in the solid and semi-solid foods. This amount is believed to be about equal to the amount eliminated by the skin through the insensible perspiration, which is about two pounds in twenty-four hours. By comparison of the body weight with the water balance many fluctuations in weight may be readily accounted for. In determining the water balance the quantity of urine is subtracted from the water intake. The tracing on the graphic shows the excess or deficiency in cubic centimetres. (Thirty cubic centimetres equal one fluid ounce.) The water balance studied with the tissue balance, with the energy balance, and the weight, leads to most valuable information.

The Per Cent Increase of Metabolism

By means of the improved Benedict-Atwater apparatus or the Tissot apparatus, it is now possible to determine the exact state of the patient's metabolism; that is, the degree of activity of the tissue change as compared with the normal. The degree of increase is indicated by the figures printed in red at the levels indicated by the tracing on the graphic.

It was formerly supposed that in diabetes the metabolic activity was lessened, but the carefully conducted researches of Benedict showed that this was an error. We now know that metabolism may be increased.

1. The degree of severity of the case may be determined. In grave cases there is a marked increase of metabolism, whereas in

mild cases the increase is slight. It is very important to know at the very outset in dealing with a case of diabetes whether the case in hand is one of the grave or the severe type. Only when the physician is possessed of such knowledge is it possible for him to give the patient definite or reliable information as to the results which may be expected from treatment.

2. The test is usually repeated at least every two weeks while the patient is under observation. It is thus possible to determine whether or not real progress in mastering the disease is being made. If the patient is actually getting better, the metabolism tests will show a lessening of the excessive activity and an approach toward normal. In cases in which the body responds readily to the measures applied, as shown by the disappearance of sugar and acidosis, the metabolism may for a short time fall slightly below the normal level. This deficiency disappears with increased feeding and exercise.

3. The findings of the metabolism determination are an important guide in relation to the amount of exercise that the patient should take. Exercise is the most powerful means of increasing metabolism. Rest is the most efficient means of lessening metabolic activity. So long as the patient's metabolism is above normal, rest is indicated. When the metabolism has been brought down to normal, exercise may be prescribed with advantage. In feeble cases, exercise will at first be very light or even may be administered by automatic means or so-called electrical gymnastics. As the training of the patient advances and improvement is established, the amount of exercise may be increased and may be made a very valuable means of increasing carbohydrate tolerance.

4. The metabolism test is also essential as a means of fixing the base ration. If the increase of metabolism is so great as to demand complete rest, the minimum base ration of twelve calories per pound of body

weight per diem will be indicated. If on the other hand the tests show a condition of metabolism which will permit a moderate amount of exercise, the base ration may be fixed at fourteen or fifteen calories per pound of body weight and may be gradually increased until the normal allowance of eighteen calories per pound, or forty calories per kilogram is approached.

5. The metabolism test is important in determining the amount of protein in the ration. In a case in which the metabolic activity is greatly increased, a very low protein diet will be indicated as one of the most efficient means of lessening abnormal metabolic activity.

The Glucose-Nitrogen (D-N) Ratio

This coefficient is determined by dividing the amount of urinary sugar by the urinary nitrogen when the patient is on a strict fat-protein diet. This coefficient is now regarded as of less importance than formerly.

The Respiratory Quotient

This coefficient is determined by the Benedict-Atwater apparatus, and is of considerable value. The quotient is obtained by an analysis of the expired air to determine the oxygen consumption and the amount of carbon-dioxide excreted during a given period. The CO_2 is divided by the oxygen. The quotient 1.00 indicates that only carbohydrates are being burned in the body. The quotient .81, which is usually found in a healthy man twelve hours after the last meal, indicates that the body is being warmed by the burning of carbohydrate and fat. A low quotient, 69 for example, indicates a grave type of disease, while a higher quotient, 73 or above, indicates a mild type. A quotient of 69 or below indicates the body has lost its power to store carbohydrates and that the body tissues are being consumed.

This determination shows the type of case. A rising quotient shows improvement.

The Feeding of Diabetics

The proper feeding of a diabetic patient is a matter of supreme importance. His life depends upon the selection of his food not only with special reference to his disease, but also with particular reference to his individual requirements. Every diabetic who really appreciates the importance of exact regulation of his diet will be willing to give to the subject of food and feeding sufficient study to become familiar with the general principles of food and feeding. Several points of primary importance have already been presented. The purpose of this section is to present practical formulas for foods suitable for diabetics and to furnish the data necessary for constructing bills of fare for all classes of persons suffering from *diabetes mellitus.*

While undergoing dietetic training for the purpose of reducing the sugar of the blood and getting the urine sugar free, it is necessary that a carefully graduated scheme should be followed.

First of all it is necessary to ascertain the patient's tolerance for carbohydrates; that is, his ability to utilize starch, sugar and dextrine. For a day or two he is allowed to eat such food as he has been accustomed to take, careful note being made of its value in calories of starch, protein and fat. The urine is collected for each twenty-four hours beginning as soon as the patient comes under observation and is submitted to the examination indicated in the accompanying blank. The stools are likewise collected and examined as indicated by the blank shown herewith.

The Capsule Test

Two capsules are given at breakfast. One contains a few inches of ordinary catgut, the other a few grains of carmine. Each stool is then examined and note is made of the following items:

1. The time when the color appears.
2. The time when the color disappears.
3. The condition of the catgut, whether digested, undigested, or partially digested.

In a normal person the color appears and wholly disappears in twenty-four hours or less. If the color is late in appearing, the indication is stasis or diminished motility in some part of the alimentary tract; the delay may be in the stomach, the small intestine or the colon. A bismuth or barium meal and a thorough *x*-ray examination by an expert roentgenologist must now be made to determine the seat of the delay so that the proper remedy may be applied, since there is ground for more than a suspicion that diabetes is closely associated with the intestinal toxemia which always results from intestinal stasis or constipation.

If the catgut is found undigested or slightly digested, a gastric test meal is given, usually the test breakfast of Ewald, and careful determination is made of the digestive properties of the gastric fluid. When the catgut is undigested, there is found either a great excess of hydrochloric acid or a very pronounced deficiency. In most cases, hydrochloric acid is absent.

The *x*-ray examination usually shows marked stasis or stagnation in the small intestine, a condition which is most frequently the result of incompetency of the ileocecal valve. When the valve is incompetent the putrefying fecal matters in the colon back up into the small intestine and the infection which results extends upward to the duodenum, stomach, gall-bladder, and pancreas, and thus may become a cause of diabetes.

An examination is made of the blood which includes besides the usual blood count a determination of the amount of sugar present which in severe diabetes is always found much increased. The state of the kidney function is also ascertained by determination of the non-protein nitrogen and other waste constituents of the blood.

After the above examinations have been made, together with a thorough going physical examination of the patient and a record of his personal and family history, a dietetic program is arranged.

The Fast

If the urine contains a large amount of sugar, say 60 grams or more in twenty-four hours, or if a smaller amount, say 20 or 30 grams of sugar appears in spite of the fact that very little carbohydrate is taken in the food, the patient is required to fast for two or three days, or in certain cases even longer. The length of the fast will be determined by the disappearance of sugar from the urine. The fast is usually continued twelve or twenty-four hours after the sugar disappears.

During the fast, the patient should remain quiet in bed, or lying on a couch in the open air. He should drink three or four quarts of liquid daily (vegetable bouillon, water, or water flavored with some acid fruit, or savora broth).

The patient also takes one or two tablespoonfuls of starch-free bran or half an ounce of agar-agar four times a day, at four-hour intervals. An ounce of paraffin oil is taken with the bran. The purpose of this is to keep the bowels active. Specially prepared bran from which the starch has been removed is used for this purpose; simply washing the bran does not remove the starch. An enema should be taken daily.

The fast is by no means so uncomfortable an ordeal as might be imagined. The patient is under the care of an attentive nurse who sees that the liquids are given at proper time and in proper amount, gives a tepid bath twice a day and a light massage morning and evening. If the patient is nervous, or restless or unable to sleep, a long neutral bath is given (94°-96° F., 30-60 min.) The nurse also finds various ways for diverting the patient's mind. The patient in fact finds his daily program so filled with diverting activities of various sorts that he gets along very comfortably. Indeed, patients rarely complain of suffering or serious inconvenience on account of the brief fast required to make the urine sugar free. Very long fasts are never prescribed. They are not only unnecessary but highly dangerous.

If sugar reappears in the urine at any subsequent time, the patient is asked to fast again for one or two days or until the sugar disappears. If the amount of sugar is very small, restriction of the diet to green vegetables for a day or two will suffice instead of fasting.

The Semi-Fast

It is found to be advantageous in most cases for the patient to take what may be termed a semi-fast once a week. Instead of his usual diet, the patient takes only green vegetables, which furnish bulk and very little nutritive material. Vegetables containing only two to five per cent of carbohydrate are used for this purpose. Elsewhere will be found a list of vegetables classified according to the amount of carbohydrate which they contain. Starch-free bran or agar-agar should be used freely on these days. One or two tablespoonfuls should be taken at each meal. The bran supplies not only bulk to encourage bowel action but also iron, lime and other salts which are highly valuable for the diabetic because of the constant loss of these salts which is especially great in diabetes on account of the large discharge of urine. Bran also supplies useful vitamines.

The patient should take an ounce of paraffin oil before each meal to insure free bowel action. Restriction of the quantity of food naturally leads to constipation unless these special precautions are taken to avoid it. Constipation increases the danger from acidosis and hinders improvement.

Graduated Feeding

After the fast, a carefully graduated diet is arranged by the physician or the trained dietitian. The amount of food taken must, of course, depend upon the patient's weight. A large person requires more food than a small person. In a mild case of diabetes in which the urine becomes sugar free on a diet consisting of about one-fourth the ordinary intake of starch, the amount of food may be increased more rapidly from day to day than in cases in which a complete fast, or even a second fast, is required to make the urine sugar free. On this account three schedules have been prepared. Schedule I for mild cases, Schedule II for more severe cases, and Schedule III for those cases which require a strictly carbohydrate-free diet for a limited period.

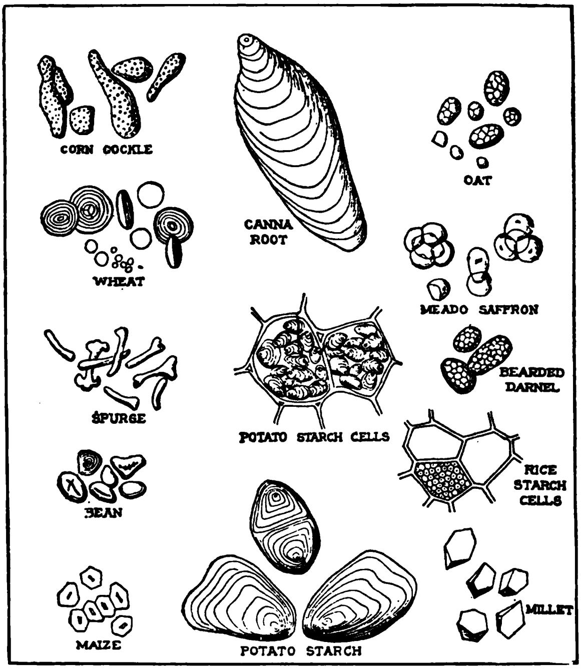
To Increase the Carbohydrate Tolerance

Experience has shown that short fasts, repeated at intervals of a week or two, increase the tolerance for carbohydrate so that the starch content of the diet may be by this means gradually increased. It has also been noted by von Noorden that the carbohydrate tolerance may be increased by taking only one kind of starch at a time; for example, the source of starch on one day may be oatmeal, another day rice, or potato, etc. Mixed starches are not well tolerated.

Starches Are Not All Alike

Recent studies of the biology of plants have disclosed the interesting fact that each plant produces a kind of starch or carbohydrate peculiar to itself. These starches differ in digestibility, and apparently also in the readiness with which the body utilizes them. Observations made by von Noorden and Falta show that carbohydrates are best tolerated by diabetics in the order named:

1. Oatmeal
2. Banana
3. Potato
4. Rice.



Starch Granules

Von Noorden also pointed out the fact that cereal starches are much better utilized when taken in the form of porridge than when baked. It is now well known that cooking at a high temperature and prolonged boiling destroy the vitamines of foods. This may be the explanation of the fact that oatmeal may in some instances be taken quite freely in the form of porridge without increasing the output of sugar, whereas the same amount of oatmeal taken in cakes will greatly increase the amount of sugar in the urine.

There is also some reason for believing that uncooked starch is appropriated better than starch which has been cooked either by boiling or baking. This may be due either to the fact that uncooked starch is less rapidly digestible and hence enters the circulation more slowly, or to the presence of the important vitamines which are destroyed by the heat of cookery.

The Low Protein Ration

Carbohydrate tolerance is found to be greatly increased by the disuse of meats. Von Noorden found that without meat five times as much starch could be taken without increasing the sugar of the urine as when meat was used with the starch.

After Sydenham and Rollo discovered, something more than a hundred years ago, that the urine of the diabetic patient could be made sugar free by a diet consisting exclusively of lean meat and fat, a fat and protein diet consisting almost wholly of flesh foods came into general use and has been practically the routine practice until within recent years. A few years ago it was pointed out by Mosse, of France, and others, that a flesh diet greatly increases the danger of diabetic coma. Von Noorden announced several years ago that "much meat is not good for diabetics." Straub and other eminent authorities have shown that "meat is especially harmful as compared with vegetable albumin," such as gluten, and the protein of peas and beans. Reach believes that "raw [rare cooked] meat has a toxic action which paralyzes the function of the pancreas," and in this way exercises an injurious effect in diabetes.

A Meatless Ration Safe and Practical

Practically all authorities on diabetes now agree that vegetable albumin or protein is much to be preferred to meat or animal protein in the treatment of this disease. That vegetable foods are entirely sufficient to maintain health and strength is now conceded by the ablest physiologists.

Says Prof. Taylor, of the University of Pennsylvania: "A proper vegetarian diet is in every way a normal and competent diet."

The advantages of a non-flesh dietary for diabetics are:

1. Vegetable proteins may be used in larger quantity than animal proteins without increasing the urinary sugar.

2. Vegetable proteins permit a larger carbohydrate intake.

3. Vegetable proteins, being less putrescible than animal proteins, as pointed out by Tissier, do not encourage intestinal putrefaction as do animal proteins, and hence are useful in combating the intestinal toxemia which is probably a leading factor in the causation of diabetes.

4. The danger from diabetic coma is less.

Vegetable Proteins

Vegetable proteins are available in such various forms that satisfactory bills of fare may be easily prepared without the use of animal proteins. In any case in which it may seem necessary to do so eggs may be added, this form of animal protein being very much less objectionable than meat as shown by von Noorden and other experienced observers.

Nuts and legumes are especially rich in protein. Cereals, especially wheat and oats, furnish highly valuable proteins of which the gluten of wheat is most important for the reason that it may be separated and made starch free.

Nuts

Nuts are the most highly nutritious of all food stuffs. Almonds, butternuts, beech-nuts, pine nuts and peanuts furnish twenty-five to thirty calories per ounce of choice proteins, in a most easily digestible and assimilable form. The following table shows the nutritive properties of the most common varieties of nuts expressed in calories per ounce:

Food Values of Nuts

	Protein Calories	Fats Calories	Carbohydrate Calories	Total Calories per oz.
Almonds	24.5	146.0	20.0	191.0
Beechnuts	25.5	153.0	15.0	194.0
Butternuts	32.5	163.0	4.0	200.0
Brazil nuts	20.0	178.0	8.0	206.0
Filberts	18.0	174.0	15.0	207.5
Hickory nuts	18.0	180.0	13.0	211.0
Pecans	11.0	188.0	18.0	218.0
Pine nuts	29.0	150.0	24.0	203.0
English walnuts	19.0	169.0	18.0	207.0
Peanuts	30.0	96.5	28.0	154.0
Ripe olives	2.0	62.5	49.0	113.5

The high fat and protein content and the very small proportion of carbohydrates present in nuts of all sorts render them almost ideal foods for diabetics. Butternuts, for example, contain only two per cent of carbohydrate, estimated on total energy value, and Brazil nuts only four per cent.

Nuts of almost any sort may be freely eaten by the average diabetic patient. They are not, of course, suited for an exclusive dietary as they are much too concentrated, being almost wholly lacking in the cellulose essential for bulk. The one thing essential for their thorough digestibility is complete mastication. Each particle must be chewed until of a smooth, creamy consistency.

Legumes

These highly nitrogenous vegetables find a useful place in the dietary of the diabetic when combined with a proper amount of fat. Peas, beans, and lentils have a high food content of which one-fourth to one-third is protein. There is little fat but considerable starch.

The soy bean is a remarkable legume which is two-fifths fat and one-third protein, giving a food content closely resembling fat meat with the addition of a small amount of carbohydrate—about one-fourth the total food value. The soy bean is a highly valuable food for diabetics.

Food Values of Legumes

	Protein Calories	%	Fats Calories	%	Carbohydrate Calories	%	Calories per oz.
Peas	32.0	27	3.0	3	77.0	70	112.0
Beans	30.0	38	8.0	7	73.0	65	111.0
Lentils	31.0	30	4.0	4	68.0	66	103.9
Soy Bean	38.0	32	48.0	40	34.0	28	120.0

Green Vegetables

Green vegetables must always constitute the bulk of the bill of fare of a diabetic patient. Green vegetables furnish a liberal supply of alkaline salts which help to neutralize the acids which form in the tissues in excess in this disease. Green vegetables are also of special service because they supply bulk with practically no starch and very little food value of any sort. Another valuable property of green vegetables is their richness in vitamines, the absence of which has been shown to be the cause of scurvy, beri-beri, rickets and pellagra. Finally, green vegetables furnish an agreeable means of filling the stomach and producing a comfortable satiety.

The following table shows the composition of the most common green vegetables:

	Protein Calories Per Oz.	Fat Calories Per Oz.	Carbohydrate Calories Per Oz.	Total
Spinach	2.7	1.25	3.9	7.8
Asparagus	2.4	.75	3.5	6.7
Cauliflower	2.3	2.00	7.0	11.3
Cabbage	3.3	1.7	9.1	14.1
Celery	1.6	.5	5.3	7.4
Lettuce	2.0	1.5	5.6	9.1
Beet greens	2.5	8.5	3.7	14.7
Turnip greens	6.0	2.0	8.0	16.0
Dandelion greens	2.7	2.5	12.0	17.2
String beans	2.7	.8	8.6	12.1
Salsify	1.0	5.3	4.1	10.4
Turnips	1.5	.5	9.5	11.5
Egg plant	1.4	.8	6.0	8.2
Palm cabbage (heart of palm)	2.5	2.0	4.0	8.5
Lily Root	5.0	1.5	Trace	6.5
Lily Flower	3.0	9.0	Trace	12.0
Bamboo Shoots	.3	.4	1.0	1.7
Bean Stick	50.0	28.0	.0	78.0

Many fruits are useful as foods for diabetics, as appetizers and because of the large amount of alkaline salts and vitamines which they supply. As most fruits are fairly rich in carbohydrates they must be used in moderation, but are sometimes better tolerated than cereal carbohydrates. The following are among the best fruits for use by diabetics:

	Protein Calories Per Oz.	Fat Calories Per Oz.	Carbohydrate Calories Per Oz.	Total
Bananas	1.5	1.6	25.7	28.8
Apples	.5	1.3	16.6	18.4
Apple juice	.0	.0	17.0	17.0
Apricots	1.3	.0	15.6	16.9
Blackberries	1.5	2.6	12.7	16.8
Blueberries	.7	1.6	19.0	21.3
Canteloupe	.7	..	10.9	11.6
Grape fruit	.9	.5	11.8	13.2
Grapes	1.16	3.2	16.6	20.9
Orange pulp	1.0	..	13.5	14.9
Orange juice	..	..	15.1	15.1
Peaches	1.0	.3	11.6	12.8
Raspberries	2.0	2.6	14.7	19.3
Strawberries	1.2	1.6	8.6	11.4
Tomatoes	1.0	1.1	4.6	6.7
Avocadoes	2.4	42.	4.6	49.0

Orange juice is highly useful in cases in which there is a strong tendency to acidosis, requiring a quick supply of carbohydrates.

A small orange supplies about 40 calories of carbohydrate. Half a grapefruit has the same value.

How to Arrange the Daily Bill of Fare

Every diabetic should learn how to arrange his bill of fare in such a way as to furnish the number of calories of protein, fats, and carbohydrates called for by his prescription. With the accompanying schedules and tables and an inexpensive pair of scales, this may be easily accomplished.

In weighing foods for diabetics the gram, or unit of the French system, is commonly employed. A gram is equivalent to 15.4 grains. Four grams equal a little more than one dram. There are thirty grams in an apothecary's ounce and twenty-eight and one-half grams in an ounce of avoirdupois.

Food values, as well as fuel values, are estimated in calories. The value of coal is determined by the number of calories of heat units obtainable from a pound of coal when it is burned. The value of food is determined in the same way. When burned in the body, the heat or other energy derived from the food is the same as that which would be derived from it if it were burned.

As has been already stated, one calory represents the heat required to raise four pounds of water one degree in temperature.

One gram of protein produces four calories of energy.

One gram of carbohydrate produces four calories of energy.

One gram of fat produces nine calories of energy.

Bills of fare adapted to any individual case may be easily arranged by use of the schedules herewith presented together with the several model bills of fare and the several tables.

In consulting the tables of food values it will be observed that the food quantities are given in servings, ounces and portions. A portion consists of one hundred calories.

Graduated Schedules

In the following pages are presented three carefully prepared schedules which have been practically tested in the treatment of a large number of cases and with most satisfactory results. In addition, sample standard bills of fare are given and a large number of recipes which have been prepared by the direction of the Battle Creek Sanitarium, and which are in daily use in this institution in the feeding of many cases of diabetes.

It is to be understood, of course, that these schedules are not to be employed in an arbitrary way. Slight modifications must be made to meet individual cases. The schedule, however, will serve to illustrate the method employed and will, at least, furnish an outline which will assist in the carrying out of a definite graduated plan. In most cases the graduated scheme may be pretty closely followed, the figures being increased or diminished as may be necessary to adapt the schedule to the individual's weight, which is necessary since the patient's weight, or rather the standard weight for a person of the patient's height, is taken as the basis for calculating the quantities given in the schedule.

The following of a schedule thus adapted to each individual case, will certainly be found a considerable improvement over the old method which recognized no difference in the intake required by individual patients whose weight might vary as much as one hundred pounds or even more.

Graduated Diet Schedule No. 1

The following schedule is to be used in cases which become sugar free on the initial diet which is identical with the diet indicated for the first day.

Energy intake calculated for body weight of 130 pounds (59 kilos)

	Carbohydrate		**Protein**		**Fat**		**Total**		
Day	**Cal.**	**Cal. per pound**	**Cal.**	**Cal. per pound**	**Cal.**	**Cal. per pound**	**Cal.**	**Cal. per pound**	**Cal. per kil.**
1	65	.5	195	1.5	260	2.0	520	4.0	8.8
2	130	1.0	195	1.5	390	3.0	715	5.5	12.1
3	195	1.5	195	1.5	520	4.0	910	7.0	15.4
4	260	2.0	195	1.5	650	5.0	1105	8.5	18.7
5	325	2.5	195	1.5	780	6.0	1300	10.0	22.0
6	338	2.6	195	1.5	845	6.5	1378	10.6	23.3

Carbohydrate			Protein		Fat		Total		
Day	Cal.	Cal. per pound	Cal.	Cal. per pound	Cal.	Cal. per pound	Cal.	Cal. per pound	Cal. per kil.
7	351	2.7	195	1.5	910	7.0	1465	11.2	24.6
8	364	2.8	195	1.5	975	7.5	1534	11.8	26.0
9	377	2.9	195	1.5	1040	8.0	1612	12.4	27.3
10	390	3.0	195	1.5	1105	8.5	1690	13.0	28.6
11	416	3.2	195	1.5	1170	9.0	1781	13.7	30.1
12	442	3.4	195	1.5	1235	9.5	1872	14.4	31.7
13	468	3.6	195	1.5	1300	10.0	1963	15.1	33.2
14	494	3.8	195	1.5	1300	10.0	1989	15.3	33.7
15	520	4.0	195	1.5	1300	10.0	2015	15.5	34.1
Work ration	650	5.0	195	1.5	1560	12.0	2405	18.0	39.6

Graduated Diet Schedule No. 2

The following schedule is to be used for patients who do not become sugar free until after several days of liquid diet or fasting.

Daily energy intake calculated for a body weight of 130 lbs. (59 kilos).

Carbohydrate			Protein		Fat		Total		
Day	Cal.	Cal. per pound	Cal.	Cal. per pound	Cal.	Cal. per pound	Cal.	Cal. per pound	Cal. per kil.
1	65	.5	65	.50	130	1.0	260	2.0	4.4
2	81	.62	97	.75	260	2.0	458	3.37	7.8
3	97	.75	130	1.00	390	3.0	617	4.75	10.5
4	113	.87	162	1.25	520	4.0	795	6.12	13.5
5	130	1.00	195	1.50	650	5.0	975	7.50	16.5
6	130	1.00	195	1.50	715	5.5	1040	8.00	17.6
7	130	1.00	195	1.50	780	6.0	1105	8.50	18.7
8	130	1.00	195	1.50	845	6.5	1170	9.00	19.8
9	130	1.00	195	1.50	910	7.0	1235	9.50	20.9
10	130	1.00	195	1.50	975	7.5	1300	10.00	22.0
11	130	1.00	195	1.50	1040	8.0	1365	10.50	23.1
12	130	1.00	195	1.50	1105	8.5	1430	11.00	24.2
13	130	1.00	195	1.50	1170	9.0	1495	11.50	25.3
14	130	1.00	195	1.50	1235	9.5	1560	12.00	26.4
15	130	1.00	195	1.50	1300	10.0	1625	12.50	27.5
16	130	1.00	195	1.50	1365	10.5	1690	13.00	28.6
17	130	1.00	195	1.50	1430	11.00	1755	13.50	29.7
18	130	1.00	195	1.50	1495	11.5	1820	14.00	30.8

Graduated Diet Schedule No. 3

To be used in cases in which a carbohydrate free diet is needed for several days.

Calculated for a body weight of 130 lbs. (59 kilos).

	PROTEIN		FATS			
Day	Cals.	Cals. per pound	Cals.	Cals. per pound	Total Cals.	Total Cals. per pound body wt.
1	65	.5	260	2.0	325	2.5
2	78	.6	325	2.5	403	3.1
3	91	.7	390	3.0	481	3.7
4	104	.8	455	3.5	559	4.3
5	130	1.0	520	4.0	650	5.0
6	143	1.1	585	4.5	728	5.6
7	156	1.2	650	5.0	806	6.2
8	169	1.3	715	5.5	884	6.8
9	182	1.4	780	6.0	962	7.4
10	195	1.5	845	6.5	1040	8.0
11	208	1.6	910	7.0	1118	8.6
12	221	1.7	975	7.5	1196	9.2
13	234	1.8	1105	8.0	1274	9.8
14	247	1.9	1235	9.0	1417	10.9
15	260	2.0	1365	10.0	1560	12.0

Use of the Schedules

In the use of the schedules it is only necessary to remember that the tables are adapted to the needs of a person having a normal weight of 130 pounds. (See table showing normal weights for different heights, page 76.) A person whose proper weight is ten per cent less, 117 pounds, should subtract ten per cent from the quantities named in the table. A person having a weight greater than 130 pounds should increase the quantities given in the schedule as may be required to make the "per pound" ration equal that shown in the schedules.

Table Showing Height, Weight, Surface, and Number of Food Units or Calories Required Daily.

MEN

Height in In.	Weight in Pounds	Surface in Square Ft.	Calories or Food Units Proteins	Fats	Carbohydrates	Total
61	131	15.92	197	591	1,182	1,970
62	133	16.06	200	600	1,200	2,000
63	136	16.27	204	612	1,224	2,040
64	140	16.55	210	630	1,260	2,100
65	143	16.76	215	645	1,290	2,150
66	147	17.06	221	663	1,326	2,210
67	152	17.40	228	684	1,368	2,280
68	157	17.76	236	708	1,416	2,360
69	162	18.12	243	729	1,458	2,430
70	167	18.48	251	753	1,506	2,510
71	173	18.91	260	780	1,560	2,600
72	179	19.34	269	807	1,614	2,690
73	185	19.89	278	834	1,668	2,780
74	192	20.33	288	864	1,728	2,880
75	200	20.88	300	900	1,800	3,000

WOMEN

Height	Weight	Surface in	Calories or Food Units			
in In.	in Pounds	Square Ft.	Proteins	Fats	Carbohydrates	Total
59	119	14.82	179	537	1,074	1,790
60	122	15.03	183	549	1,098	1,830
61	124	15.29	186	558	1,116	1,860
62	127	15.50	191	573	1,146	1,910
63	131	15.92	197	591	1,182	1,970
64	134	16.13	201	603	1,206	2,010
65	139	16.48	209	627	1,254	2,090
66	143	16.76	215	645	1,290	2,150
67	147	17.06	221	663	1,326	2,210
68	151	17.34	227	681	1,362	2,270
69	155	17.64	232	696	1,392	2,320
70	159	17.92	239	717	1,434	2,390

Standard Bills of Fare

The following bills of fare may be used as models for supplying the quantities of food indicated for each one and are intended for use in connection with a graduated dietary:

No. 1

BREAKFAST

Asparagus broth
4 oz. sliced tomatoes
2 oz. gluten bread
3 gluten sticks
¼ oz. butter
Cereal coffee and cream

DINNER

Tomato soup
4 oz. cabbage
2 oz. cucumber
3 oz. celery
2 gluten sticks
¼ oz. butter
Unsweetened lemonade

SUPPER

Savora broth
4 oz. asparagus
4 oz. sliced tomato
Poached egg
2 gluten sticks
¼ oz. butter
Kaffir tea and cream

	Protein	Fats	Carbohydrate	Total
Total for the day........	67	266	55	388

No. 2

BREAKFAST

Spinach broth
4 oz. asparagus
2 oz. celery
2 oz. lettuce
Poached egg
¼ oz. butter
2 gluten sticks
Cereal coffee and cream

DINNER

Tomato soup
3 oz. string beans
3 oz. spinach
3 oz. cucumber
½ oz. Yogurt cheese
¼ oz. butter
Unsweetened lemonade

SUPPER

String bean broth
4 oz. artichokes
4 oz. sliced tomatoes
4 oz. endive
2 gluten sticks
¼ oz. butter
Kaffir tea and cream

	Protein	Fats	Carbohydrate	Total
Total for the day........	79	315	59	453

No. 3

BREAKFAST

Asparagus broth
4 oz. sliced tomatoes
2 oz. celery
Scrambled egg
Cereal coffee and cream
½ oz. olive oil

DINNER

Tomato and celery soup
4 oz. asparagus
3 oz. spinach
2 oz. summer salad
3 gluten sticks
½ oz. butter
½ oz. Yogurt cheese

SUPPER

Okra soup
3 oz. mashed turnips
2 oz. cucumber
3 oz. carrots
3 gluten sticks
½ oz. butter

	Protein	Fats	Carbo-hydrate	Total
Total for the day........	89	489	57	635

No. 4

BREAKFAST

Savora broth
4 oz. sliced tomatoes
2 oz. lettuce
2 oz. cucumber
Soft boiled egg
Cereal coffee and cream
¼ oz. butter

DINNER

Tomato soup
3 oz. spinach
3 oz. cabbage
3 oz. watercress
½ oz. olive oil
2 oz. cottage cheese
½ oz. butter
Unsweetened lemonade

SUPPER

Spinach broth
3 oz. string beans
3 oz. artichokes
2 oz. celery
½ oz. Yogurt cheese
Kaffir tea and cream

	Protein	Fats	Carbo-hydrate	Total
Total for the day.......	103	429	69	701

No. 5

BREAKFAST

Savora broth
4 oz. sliced tomato
2 oz. celery
2 scrambled eggs
¼ oz. butter
Cereal coffee and cream

DINNER

Tomato soup
3 oz. string beans
3 oz. asparagus
Salad in tomato cups
1 oz. spinach
3 oz. carrots
3 oz. endive
1 egg (poached)
¼ oz. butter
½ oz. olive oil
Kaffir tea and cream

SUPPER

String bean broth
4 oz. vegetable oysters
4 oz. stewed tomatoes
3 oz. steamed cabbage
1 egg omelet
4 gluten sticks
⅛ oz. butter
Kaffir tea and lemon

	Protein	Fats	Carbo-hydrate	Total
Total for the day…….	124	529	88	741

No. 6

BREAKFAST

Asparagus broth
4 oz. sliced tomatoes
2 oz. lettuce
2 oz. cucumber
2 egg omelet
Cereal coffee and cream

DINNER

Celery soup
3 oz. cabbage
3 oz. artichokes
3 oz. string bean salad
½ oz. Yogurt cheese
½ oz. butter
Unsweetened lemonade

SUPPER

Cabbage broth
4 oz. asparagus
3 oz. endive
3 oz. Brussels sprouts
Baked egg in cream
4 gluten sticks
½ oz. butter
½ oz. olive oil
Kaffir tea and cream

	Protein	Fats	Carbohydrate	Total
Total for the day.......	145	569	64	778

Foods to Be Wholly Avoided by Diabetics

Sugar
Sweet desserts
Sweet fruits
Honey
Tea
Alcoholic drinks
Meats (fish, flesh, fowl)
Chestnuts
Breakfast cereals
White flour breads
Coffee

Foods Containing a Moderate Amount of Carbohydrates

The following foods may be safely used in great moderation by patients whose carbohydrate tolerance permits the use of 500 or 600 calories of carbohydrate daily:

Rye bread
Bran Bread
Apples
Orange juice
Peaches
Peanuts
Soy bean
Nuts of all sorts
Bamboo shoots
Palm cabbage

Grapefruit
Protose
Nuttolene
Buttermilk
Asparagus
Green vegetables
All foods free from carbohydrates
Strawberries

Foods Practically Free from Carbohydrates

Butter (sterilized or washed)
Olive oil
Butternuts
Brazil nuts
Lettuce
Celery
Cucumber
Radish
Lily root
Lily flower
Nut oils
Bean stick
Pure gluten biscuit
Extracted vegetables
Eggs
Dandelion greens
Turnip tops
Beet tops
Spinach

"Extracted" Vegetables

In general, green vegetables contain *very little starch* and only a small amount of carbohydrates. When they are boiled in a considerable quantity of water, the carbohydrates are "extracted." By repeated boiling nearly all the small amount of carbohydrates present may be removed since they are almost wholly in the soluble form of dextrine or sugar.

In preparing "extracted" vegetables, the raw food is first boiled in four times its weight of water for half an hour. Then pour off the water, add an equal quantity of boiling water and boil for fifteen minutes. Again change the water and boil for fifteen minutes longer. Extracted vegetables prepared in this manner by thrice boiling furnish about one calory of carbohydrate per ounce, a quantity so small that it may be ignored except in the gravest cases.

The following list includes vegetables from which the carbohydrates may be almost wholly removed by boiling three times in a liberal amount of water and which contain after boiling only about one calory of carbohydrate per ounce.

Extracted Vegetables

Turnips
Cabbage
Parsnips
String beans
Palm cabbage
Carrots
Vegetable oysters
French artichokes
Rutabagas

General Health Rules for Diabetic Patients

While regulation of the diet is a matter of primary importance in diabetes, it is by no means a panacea. The bodily functions of the diabetic are seriously crippled and his vital resources must be promoted in every possible way. Special attention should be given the following:

While the diet is of supreme importance, there are other measures of very great value which should not be neglected. Diabetic patients suffer from many secondary ailments which require attention. Constipation, neuritis, neuralgia, rheumatism, high blood pressure, disease of the kidneys, dry skin, impaired eyesight, these are a few of the accompanying ailments requiring attention.

The electric light bath, sun bath, artificial sunlight bath, the air bath, oil rubbing, massage, and various forms of electrical applications, are all valuable in the treatment of diabetes through the beneficial effects upon the skin, the eliminative functions and the nervous system.

Out-of-Door Life

Fresh air sleeping and out-of-door life are nearly as valuable in the treatment of diabetes as in the treatment of consumption, or pulmonary tuberculosis. A diabetic patient should live out-of-doors. He should sleep in the open air by means of a sleeping porch or balcony, wide open windows or window tent, at all seasons of the year.

Green Vegetable Days

While the diabetic is under training, that is, while his case is being carefully studied and his diet regulated for the purpose of getting the urine sugar free, reducing the blood sugar and increasing the carbohydrate tolerance, the patient is given at frequent intervals so-called green vegetable days in which the dietary is practically confined to such green vegetables as contain little or no carbohydrate. In mild cases and in cases in which marked improvement has been attained, ordinary green vegetables may be employed, but in very severe cases in which it is found difficult to make the urine sugar free, the extracted or thrice boiled vegetables should be used. It is important, however, to remember that in removing the carbohydrates of vegetables by repeated boiling, the highly valuable vitamines which they contain are also removed. Vitamines are necessary as activators of the body enzymes and ferments. They may be restored by adding to the extracted vegetables concentrated extracts known to be rich in vitamines. Bran and the outer covering of cereals contain important vitamines. Savora prepared from yeast is a concentrated preparation of vitamines.

On green vegetable days the diabetic should take little exercise.

Exercise

Under normal conditions nearly all the sugar burnt in the body is consumed by the muscles. When the muscles are active the amount of sugar consumed may be increased from three to ten times the rate of consumption during a state of complete rest. It is hence apparent that exercise must be one of the most effective means of increasing the utilization of sugar.

In health, muscular energy is derived from the burning of sugar. Two-fifths the weight of sugar consists of pure carbon, which when burned in the body produces the same amount of energy as though it were burned in a furnace. The energy value of an ounce of sugar is about 100 calories, equivalent to 300,000 foot pounds of energy. A person weighing 100 pounds will burn up an ounce of sugar in walking two miles at the rate of three miles an hour. A person weighing 200 pounds will burn the same amount of sugar in walking one mile.

It is important to remember, however, that active exercise is not always best for a diabetic. A diabetic who is fasting or is losing flesh or whose metabolism is already too active should avoid much exercise. When, however, under careful dieting the excessive metabolism has been controlled, a considerable amount of exercise may be taken with advantage. Among the best forms of exercise are the following:

Walking

Walking at the rate of about three miles an hour, beginning with one mile a day, the distance may be gradually increased to five or six miles. When walking, the chest should be carried high so as to promote correct breathing. Care should be taken to breathe deeply.

Stair Climbing

Stair climbing is one of the best forms of indoor exercise, especially useful when the weather forbids exercise out of doors. Climbing and descending an ordinary flight of stairs having a height of 12 feet, eighteen times, is equivalent to walking one mile on a level, and will burn up more than half an ounce of sugar.

Swimming

Swimming is another capital exercise for diabetes. Sea bathing is particularly good, but should never be indulged in so long as to produce exhaustion or chilling.

Surf Bathing in a Bath Tub

Surf bathing by the aid of a special device which enables one to execute swimming movements in a bath tub is an excellent substitute for ocean bathing. Salt may be added to the water if desired.

Stretching Exercises

Stretching exercises are an excellent means of maintaining suppleness. On waking in the

Resistive Movements

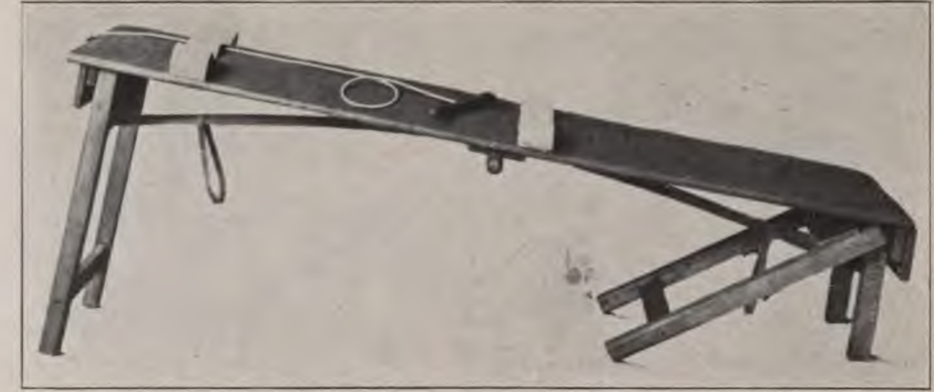
Resistive movements are an excellent means for persons who are rheumatic or for any other reason cannot engage in walking or other active exercise. In these movements, opposing sets of muscles, flexors and extensors, are made to act strongly at the same time. The effect of this double action is to cause a certain rigidity of the exercising limb. The muscles may thus be made to do a large amount of work without lifting weights or the use of apparatus of any sort. Repeat many times.

Flexion and Extension Movements

These movements consist in alternate flexion and extension movements of the arms and legs. Each movement should be repeated eight times. The exercises may be taken in the lying, sitting, or standing position, as the patient's strength may permit.

Heel Raising

This simple exercise has the advantage that the amount of work done may be quite accurately estimated. In raising the body upon the toes by contracting the leg muscles the entire weight of the body is lifted. The body is lifted on an average about two inches. Six repetitions of the movement is thus equivalent to lifting the body one foot. The movement is so simple it can be executed quite rapidly or at the rate of 120 times per minute, equivalent to lifting the body twenty feet in a minute. If the weight of the body is 150 pounds, the amount of work done in one minute at this rate would be 3,000 foot pounds which, according to the experiments of Zuntz, requires the expenditure of about four calories of energy represented by one gram of starch or sugar. In thirty minutes an ounce of sugar may be burned. Walking with heel raising is a very vigorous form of exercise in which the work done is double that done in ordinary walking.



Inclined Folding Exercise Table

This exercise differs from ordinary walking in that at each step the body is raised upon the toe.

Inclined Plane Exercises

Exercises taken with the body supported upon an inclined plane, the head downward, are of very special value in diabetes. The position drains the congested liver, pancreas, and other digestive organs, of blood and relieves the congestion of the portal vessels.

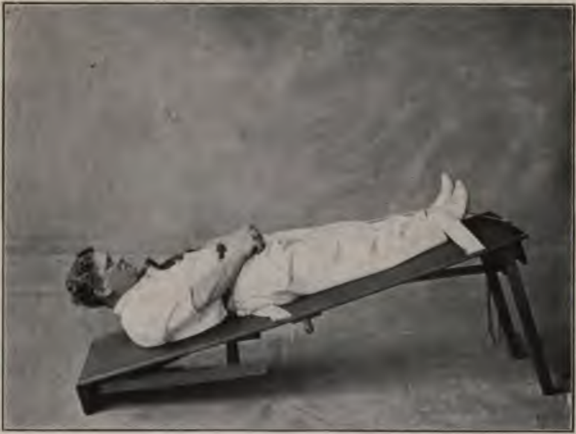
A special exercise table such as is shown in the accompanying cut is convenient, but the exercise may be taken by means of a simple board, one end of which may be placed on the edge of a window sill or bed, the other end resting on the floor. For convenience, handles should be attached to the sides of the board near the middle and a rope four or five feet long should be attached to the upper end. A strap placed across the board near the upper end to catch the feet is a useful addition.

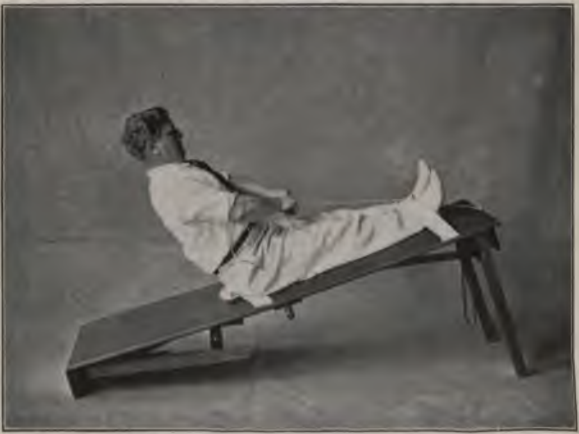
The following are a few of the many excellent exercises which may be executed with this simple appliance:

(a) Lying upon the table with the head at the floor, place the hands at the lower abdomen and breathe deeply; press firmly upon the abdominal walls with the hands while breathing in, and while breathing out move the hands upward, pressing deep with the fingers so as to move the prolapsed viscera toward the chest. Repeat eight times. While taking this movement, the body may be easily held in place by slipping the toes under the strap as shown in the accompanying cut.

(b) Seize the handles at the sides of the board, release the feet from the strap, take a deep breath and with the legs fully extended, raise the legs and breathe out. Repeat slowly ten to forty times.

(c) Grasp the rope with both hands, and keeping the muscles rigid raise the trunk to the perpendicular by pulling on the rope and returning to position four to eight times.





Inclined Table Exercises

Be careful to breathe deeply while taking these movements. The best way to rise from the table is to grasp the rope and pull the head and shoulders up; then swing the feet over to the floor.

Automatic Exercise for Feeble Patients

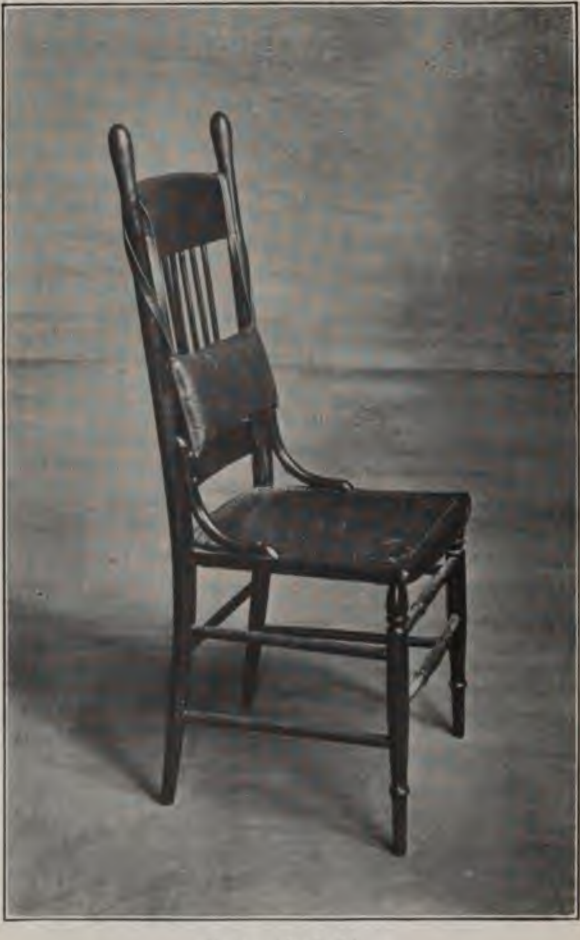
Persons who have weak hearts, diseased kidneys, or rheumatic joints, so that any considerable amount of exercise is impossible, may be greatly benefited by means of automatic exercise in which the muscles are made to act and do actual work by electrical stimulation. A convenient apparatus now in use for this purpose makes possible very exact regulation of the amount of work done. By this means the rate of metabolism, or fuel consumption, may be increased to any degree desired. As high as 800 per cent increase has been observed. This is evidently a very excellent means of aiding the body in burning up its sugar and thus increasing the carbohydrate tolerance. By means of automatic exercise a person may be enabled to do muscular work sufficient to consume two to four ounces of sugar in an hour.

Posture

Posture in sitting as well as while exercising is a matter of great importance. The back should be supported by a forward curve in the back of the chair (see cut) or by means of a cushion placed in the hollow of the back so as to keep the chest always elevated, thus maintaining active tension of the abdominal muscles by means of which the blood vessels of the internal viscera are supported. This aids in combating the disturbed conditions of the liver and pancreas which are present in practically all cases of diabetes.

The Abdominal Supporter

An abdominal supporter should be worn by diabetics who have weak abdominal muscles. It supports the vessels and aids in holding the colon and other organs in po-



Chair with Cushion

sition, and assists in maintaining a correct position of the chest, and so promotes normal breathing.

Hydrotherapy

Hydrotherapy renders great service in the treatment of diabetes in two ways;

1. By aiding the body in burning up its sugar. Cold applications to the skin increase the muscle tonus through which the utilization of sugar is encouraged.
2. Bathing, both hot and cold, improves the circulation of the blood in the skin and thus improves its nutrition. Sweating baths aid in combating acidosis.

Water Drinking

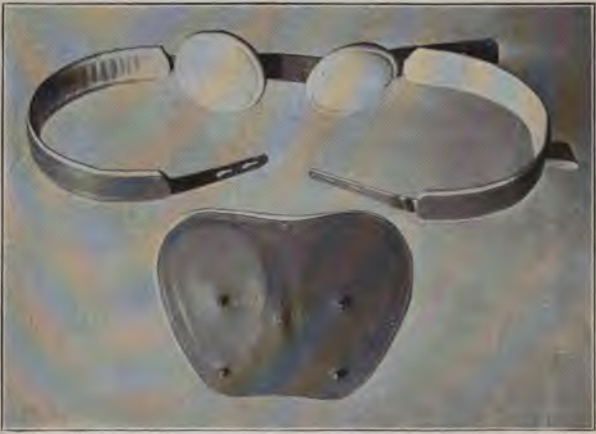
The free use of water is highly important in diabetes. The old idea that water drinking should be limited in these cases is wholly erroneous. Patients may drink with advantage three or four quarts daily, even though thirst may not demand this amount. In certain cases copious water drinking has seemed to produce decidedly beneficial effects.

Warm Bathing

Short warm water baths taken at night just before retiring are beneficial. The temperature of the bath should be about 100° F. for two or three minutes and 94° to 98° F. for twelve or fifteen minutes.

Light Baths

The electric light bath is perhaps the best of all means of producing skin activity. Perspiration is quickly produced by the stimulating effect of the light upon the skin glands without over-heating the body. It should not be long continued after sweating begins. The bath should be followed by a very short, cold shower bath, or a tepid bath at a temperature of 89° to 92° F. for two or three minutes. Sun baths are highly useful.



Abdominal Spring Supporter

The Air Bath and Oil Rubbing

The air bath with oil rubbing is an excellent means of keeping the skin in good condition. The whole body is exposed to cold air and vigorously rubbed and lubricated for three minutes, using olive oil or fine vaseline, or better still, lanolin cream.

Lanolin Cream

In cold weather, the bath should be always followed by an application to the skin of lanolin cream. For the following excellent formula we are indebted to Dr. Bulkley:

Lanolin	2 drams
Solution boroglyceride	1 dram
Cold cream	6 drams

This simple preparation is an excellent means of relieving dryness of the skin which is frequently very annoying in cold weather. Any desired amount of the cream may be prepared, using the formula proportions.

Special Maladies and Dangers Associated with Diabetes

Neuritis and muscular pains are often a source of great suffering in cases of diabetes. Warm baths, fomentations, the electric light bath or local applications of light, diathermy, and electricity in various forms are all useful means of relieving these distressing pains. It is a most gratifying observation that neuritis and other pains usually disappear very soon after the urine becomes sugar free.

High blood pressure is frequently found in advanced cases of diabetes, especially in elderly persons. A great excess of sugar in the blood gives rise to irritation of the lining membrane of the blood vessels, the result of which is thickening, and other changes characteristic of arteriosclerosis. When the sugar disappears from the urine the blood pressure falls, and in cases which are not of too long standing the blood pressure may return nearly to normal. High blood pressure is sometimes due to changes in the kidneys. In these cases, if the renal disease is far advanced, complete return to normal cannot be expected. Disease of the kidneys is quite common in diabetes because of the excessive work required of the kidneys.

The old method of treating diabetes, which included excessive feeding of the patient, especially a heavy meat diet, which was almost universally advised, was a most effective means of encouraging the development of *Bright's disease.* The more rational views of diabetes which are being promulgated at the present time will greatly lessen the mortality of diabetics from Bright's disease. No up-to-date physician would think of recommending a hearty meat diet for a person showing albumin and casts in the urine. The kidneys of a diabetic are always overtaxed and hence need special care.

Warm baths, gentle massage, the electric light bath, the limited use of salt, automatic exercise, and diathermy are safe and excellent means of reducing blood pressure in this disease as well as in other conditions in which the blood pressure is raised.

Tuberculosis of the lungs is a quite common cause of death in diabetes although the proportion of diabetics who die from this disease is probably not so large as has been supposed. Recent experience also shows that diabetics who contract tuberculosis may be cured of the disease by the outdoor life, and other measures which have in recent years been found so successful in the treatment of pulmonary tuberculosis.

Anesthesia produced by ether or chloroform has been long known to be highly dangerous in persons suffering from diabetes because of the great frequency with which diabetic coma and even death appear after the administration of these anesthetics. This danger is due to the fact that anesthetics produce acidosis, the condition which leads to diabetic coma. When the condition of acidosis already exists it will be readily seen that the additional acidosis induced by the anesthetic may easily lead to the development of coma. It is now known, however, that the patient who requires the administration of an anesthetic for the performance of a surgical operation may be carried safely through the ordeal by taking care to make his urine free from sugar and acids for some days preceding the operation by means of the methods pointed out in the preceding pages.

Diabetic Coma

Diabetic coma has long been recognized as the greatest of all dangers to which the diabetic patient is exposed. While the nature and causes of this condition are perhaps not yet fully understood, it is known that the condition of coma is associated with the accumulation in the blood of poisons derived from fats. It is also known that the free use of meat, as well as excessive quantities of fat, is likely to encourage the development of coma. Coma may in fact be looked upon in most cases as fat poisoning. The excessive use of fat must be carefully avoided in arranging bills of fare. By taking proper precautions it is probable that diabetic coma may be prevented in nearly all cases. A careful lookout must be kept for the warning symptoms, a sensation of weakness, foul stools, constipation and loss of appetite. As soon as symptoms of this sort appear, active measures must be taken at once. The bowels should be made to act freely by means of saline laxatives and large enemas. The patient must drink large quantities of water—a glassful every hour if possible. Fats should be wholly withdrawn from the diet. Carbohydrates and a moderate amount of protein may be continued for a day or two. Protein should then be dropped and the carbohydrates, after another day or two diminished by one-half, then dropped entirely for a day or two during which time the patient fasts. If the sugar disappears, as will almost always happen, acidosis and the symptoms of coma will also disappear. Every case of this sort should have the benefit of the best medical skill to be obtained.

Coma sometimes results from a deficiency of fluids in the body. In bad cases of diabetes the discharge of fluids from the body may be much greater than the intake. The patient must be encouraged to drink water freely. Care must also be taken to supply the natural salts of the body. The tissues of the diabetic are likely to be drained of "salts," and this is in some instances the cause of the great loss of flesh. Vegetable broths are especially valuable as a means of replacing the salts thus lost. For this reason vegetable broths should be freely taken during periods of fasting, and the use of extracted vegetables should not be continued for long periods of time, for the process of extracting them removes valuable nutritive salts as well as the carbohydrates which they contain. The use of the very large quantities of soda, recommended by some authorities, is generally of doubtful value. The use of alcohol, which has also been recommended, is quite unnecessary and may be very harmful.

Constipation

The bowels normally move at least three times a day; that is, a bowel movement occurs after each meal. This is the normal rhythm of bowel action. Frequent bowel movement is especially important in diabetes as the most effective means of combating the intestinal toxemia which probably is a potent factor in producing this disease. Green vegetables, which compose the chief bulk of the bill of fare in diabetes, are highly beneficial through their bulkiness which acts as a mechanical stimulus to the bowels; but in most cases additional stimulation is required to secure three or four bowel movements daily. The diabetic should make free use of bran.

Bran is especially prepared for this purpose from which the starch, which is present in large quantities in ordinary bran, is practically all removed. A heaping tablespoonful of bran should be taken at each meal. A half ounce, or an ounce, of paraffin oil, preferably in the form of emulsion or paraffin tablets, should be taken also at each meal. Agar-agar may be used instead of bran.

The wearing of a spring abdominal supporter also promotes bowel action, especially in cases in which the abdominal muscles are weak and the bowels prolapsed.

Skin Diseases

There is no chronic constitutional disease in which the skin is so much disturbed as in diabetes. Among the various skin maladies from which diabetics are likely to suffer are the following:

(1) Gangrene; the result of degeneration of the blood vessels.

(2) Bronzing of the skin, which may be

very intense, giving to the skin a decided bronzed or brownish appearance, or less pronounced in degree, is a condition in which the skin has a light canary or deep orange yellow color. This condition of the skin is usually most marked in cases in which acidosis is present and is more intense as the acidosis is more pronounced.

(3) Acne.

(4) Eczema, especially of the genitals.

(5) Pruritus.

(6) Urticaria.

(7) Paronychia with loss of hair.

(8) Dryness of the skin. Atrophy of the respiratory glands.

(9) Wrinkling of the skin and thinning of the nails.

(10) Dupuytren's contraction.

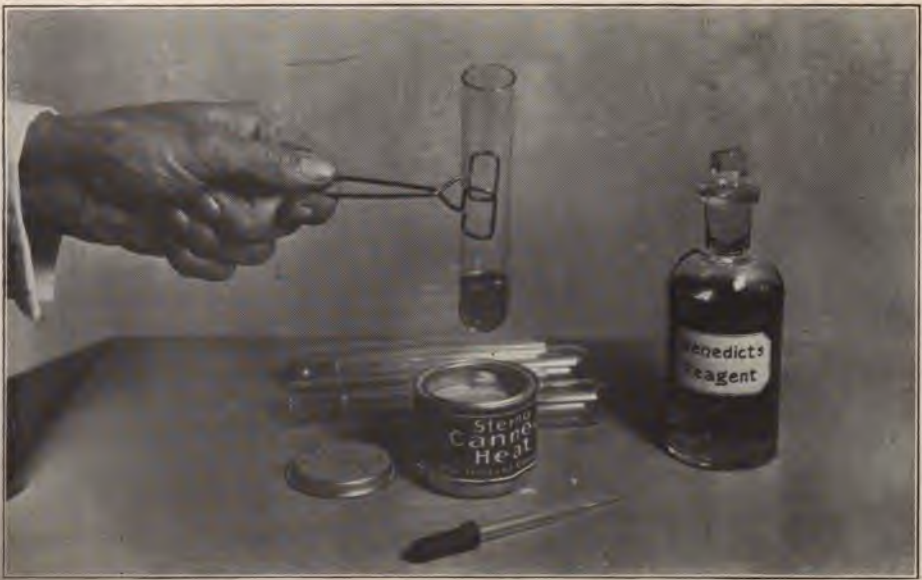
Practically all these conditions soon disappear when the urine is made sugar free. For complete and permanent results however, it is necessary that the sugar content of the blood should be brought to normal.

Gangrene of the extremities, usually beginning with the toes is not uncommon in advanced cases of diabetes. It is now known that gangrene is quickly checked and healing promptly takes place when the urine is made free from sugar by the methods outlined in the foregoing pages. Infections of all sorts are more serious and more likely to prove fatal in persons suffering from diabetes than in other persons. Resistance to germs is raised when the urine is made free from sugar.

Watching the Case at Home

Every case of diabetes requires careful and constant watching. When possible, every case should be under the care of a physician experienced in dietetic treatment and in the special care of diabetic cases. Every patient should know how to test his own urine for sugar and for harmful acids, and should apply these tests often, at least once a week, even after the sugar has been made to disappear by a course of institutional care and treatment. After returning home the patient should place himself under the care of a physician, and should make regular reports of his condition so that he may not by any oversight slip back into his original condition. It is much easier to maintain improvement than to regain lost ground.

The methods used for testing the urine for sugar are simple and may be easily learned.



Utensils for Urinary Test

Directions for Testing the Urine

Collection of the Specimen

Use for the purpose only glass jars or bottles which have been thoroughly cleaned and scalded with boiling water. During the collection keep the jar well covered and in a cool place. The specimen to be analyzed should be taken from a 24-hour collection. This is obtained in the following manner:

Empty the bladder at the usual time of rising in the morning, say 7 A. M. This is to mark the beginning of the collecting period. Hence, this passage is *not to be saved* (unless the urine is collected daily in which case this passage will of course be the last to be saved for the specimen of the day before.) Then carefully save all the urine passed until 7 A. M. the next day, taking care to completely empty the bladder at the last-named hour. If the quantity is large and requires several containers to hold it, the whole of the 24-hour collection should be poured into one vessel, large enough to hold it all so as to secure thorough mixing. Note the total quantity, measuring very accurately. If it is desired to send to the laboratory a specimen for complete analysis, fill a perfectly clean bottle or jar, holding at least one pint, with the mixed urine, seal properly and label with the patient's name and the total quantity of urine passed. Add half a dram of toluol to preserve.

The following tests should be made:

1. *The specific gravity.* Place enough urine in the cylinder to float the urinometer. Take the reading just below the surface of the urine. The urine tested should be at the ordinary room temperature, which will be the case if the specimen has been standing in a room of ordinary temperature for some hours. The normal specific gravity is 1016 to 1020. A high specific gravity is ground

for suspecting sugar. As the sugar of the urine diminishes, the specific gravity falls.

2. *Diacetic acid.* Five c. c. of the urine (a large teaspoonful) is placed in the test tube. Add, drop by drop, the ferric chlorid solution as long as a precipitate forms. Filter, and to the filtrate add a few drops more of ferric chlorid.

If diacetic acid is present a violet-red color will be obtained.

This test can be made without filtering, as follows:

To three or four c. c. of urine (a small teaspoonful) in the test tube, add an equal amount of ferric chlorid. If diacetic acid is present, the violet-red color will appear. This color may be due to other substances; but if on heating the mixture the color fades, this indicates that the color was due to diacetic acid.

3. *Test for Sugar in the Urine.* To test for sugar five c. c. (a large teaspoonful) of the test solution is placed in a test-tube. Add

eight to ten drops, not more, of the urine to be tested. While shaking, the mixture is heated to boiling, and is kept at this temperature for two minutes, or the tube may be held in boiling water for five minutes. It is then allowed to stand until cool. In the presence of sugar, the entire body of the solution will be filled with a precipitate, which may be *red, yellow,* or *greenish* in tinge. If the quantity of sugar is low (under 0.3 per cent), the precipitate forms only on cooling. If no sugar is present, the solution either remains perfectly clear or shows a faint turbidity that is blue in color.

If the above tests show sugar or acids, even a trace, the diet must be changed at once. A fast day, or even a green vegetable day, will usually suffice to cause the sugar to disappear. When a trace of sugar still persists, a second or even a third day of fasting may be necessary. Then the diet must begin at a lower level, say one-half the former amount of carbohydrate, and if the acid test is very pronounced, two-thirds the former amount of fat; then gradually increase the amount of starch and fat from day to day, stopping a little short of the amount of carbohydrate or of fat which caused the sugar or acid to appear. After some time, a week or two, another attempt may be made to increase the amount of carbohydrate or fat. This increase should follow a green diet day.

Recipes for Foods Suitable for Diabetics

The greatest care must be used in the preparation of food for a diabetic. Quantities must be carefully determined by exact measurement or by weighing with accurate scales. The following simple appliances are necessary:

(a) Half pint measuring cup divided into fourths and thirds.

(b) A glass graduate, measuring at least 6 oz.

(c) A spring balance, which can be easily read to ¼ of an ounce. (Very excellent spring balances can be obtained now which have a movable dial making it unnecessary in the weighing to first weigh the dish).

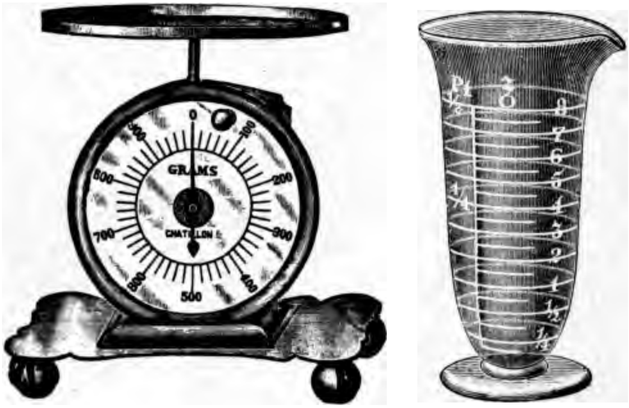
HOW TO MEASURE

All measurements given in this book are *level* unless otherwise stated.

To measure to a cupful, fill to a little more than the brim by placing materials into the cup with a spoon, never dragging the cup through dry materials. For measuring liquids fill just to the brim.

With the cutting edge of the knife, brush off all materials which are piled above the brim. Do not shake the cup to level materials.

To measure a tablespoonful, fill the spoon rounding or heaping full and with the cutting edge of the knife brush off all that extends above the edge of the spoon. If one half tablespoonful is desired, divide the con-



Food Scales and Graduate Glass

tents of the spoon lengthwise and push off one-half. If one-fourth is desired, divide the remaining one-half crosswise of the spoon and push off the portion not desired. If one-eighth is desired, divide the remaining one-fourth crosswise and push off the undesired portion. If one-third of a spoonful is desired, divide the contents of the spoon crosswise into thirds, pushing off the undesired portion.

To measure spoonfuls of liquid dip the spoon into the liquid.

To measure butter or other solid fats, pack solidly into the measure and level as for dry materials.

TABLE OF WEIGHTS AND MEASURES

3 teaspoons	1 tablespoon
16 tablespoons	1 cup
2 cups	1 pt.
1 tablespoon butter	½ oz.
1 tablespoon liquid	½ oz.
1 tablespoon flour	¼ oz.
1 cup liquid	8 oz.
1 cup butter	8 oz.
1 cup flour	4 oz.
1 cup cornmeal	5 oz.
1 cup chopped vegetables	4-6 oz.
1 egg	1½ oz.
1 egg yolk	½ oz.
1 cup chopped nuts	4 oz.
1 cup rolled oats	3 oz.

The following abbreviations are used in the recipes:

Cup	C.
Tablespoon	tbsp.
Teaspoon	tsp.

Pint	pt.
Quart	qt.
Ounce	oz.

It is very essential that an accurate record of food units consumed in twenty-four hours be kept. In order to do this it is necessary to weigh or measure accurately every article of food which appears on the bill of fare. The glass graduate is used for liquids and the spring balance for solids.

If all food served the patient is not eaten, that which is left should be accurately weighed and deducted from the original amount. From this result can be calculated by aid of the table of caloric values, the food units consumed by the individual in 24 hours.

The special foods referred to in the following recipes are on sale by most of the leading grocers throughout the country. If on inquiry you find your grocer does not have in stock any food you wish to make a trial of, the publishers of this book will gladly put you in touch with some dealer who can supply you.

Recipes which may be used by patients who require temporarily a carbohydrate-free diet are marked A. Those suitable for patients who are not allowed more than 200 calories of carbohydrate are marked B. Recipes which may be freely used only by those who have a higher carbohydrate tolerance are marked C. Recipes which may be used for patients who are on liquid or fasting diet are marked F. Those suitable for green vegetable days are marked V. Recipes which may be used for more than one class of patients are indicated by the corresponding letters. It will be understood, of course, that those who are able to use recipes marked B, may also use those marked A, F or V, and those who can use recipes marked C may also use any of the other recipes.

Soups

CREAM OF ALMOND SOUP (B-C)

¼ c. almond butter 1⅓ c. cream
2⅔ c. water 1 tsp. salt

Place almond butter in a double boiler. Pour hot cream and water gradually on this, stirring meanwhile. Salt and serve. This makes one quart.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4¾ oz.)...	5	134	17	156

CREAM OF ASPARAGUS SOUP (B-C)

1½ c. asparagus purée 2 c. cream
1 tsp. salt (scant) ½ tsp. savora extract

Heat the cream in a double boiler, add the asparagus purée and salt. Mix well and serve very hot.

Prepare the purée by mashing canned or cooked asparagus through a colander or sieve.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4¾ oz.)...	8	128	16	156

ASPARAGUS BROTH (A-F-V)

2 c. asparagus purée 1 tsp. salt
1 tsp. savora extract 1 qt. water

Add water to purée, heat, salt and serve.

Calories per serving 4¾ oz.

CREAM OF STRING BEAN SOUP (B-C)

1 c. string bean purée 1 pt. water
1 qt. cream

Combine the water and cream, add string bean purée and serve very hot.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4¾ oz.)...	7	128	15	150

CABBAGE BROTH (A-F-V)

½ medium small cabbage
1 tsp. savory salt or onion salt
1½ qts. water
½ tsp. savora extract

Cut cabbage fine, cook 15 min. Drain, press out water and season liquid with savory salt and savora.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4¾ oz.)...	4	29	9	42

CREAM OF CELERY SOUP (B-C)

1 c. celery
1 tsp. salt
2c. cream
1 tsp. savora

Heat the cream in double boiler. Add celery (part pulp and part diced) and salt. Serve very hot.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4¾ oz.)...	10	164	18	192

CREAM OF CRECY SOUP (B-C)

1⅓ c. diced carrots (thrice cooked)
2½ c. cream
1 tsp. salt
1 bay leaf
1 c. water
Onion
½ tsp. savora extract

Cook carrots in water, steep bay leaf and onion in cream in double boiler. Remove the bay leaf and onion and add carrots in form of purée. Add seasoning and serve.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4¾ oz.)....	9	149	18	176

CREAM OF LETTUCE SOUP (B-C)

1½ c. steamed lettuce
2 c. water
½ tsp. savora
1 tbsp. butter
1½ c. cream
1 tsp. salt

Heat cream and water in double boiler, add lettuce; put through a colander; add savora, salt and butter. Serve.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4¾ oz.)...	6	107	10	123

MUSHROOM BROTH (B-C)

1 medium-sized onion
½ c. chopped mushrooms
Chopped parsley
2½ c. savora broth
2 tbsp. butter

Add the butter and parsley after the other ingredients have been cooked one-half hour.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4¾ oz.) .	3	57	14	74

NUT BOUILLON (B-C)

1½ tbsp. nut butter
½ c. strained tomato
1¼ tsp. salt
3½-4 tbsp. chopped onion
2-3½ tsp. browned gluten flour
1 qt. water

Rub the nut butter smooth with part of the water, simmer all ingredients together one to one and one-half hours. Strain vegetables out, add water to make 1¼ qts. Heat and serve.

To clear: Add water for one quart only. Cool, beat with the white and shell of one egg, set over the fire and boil rapidly, at the same time removing the scum. Let stand off the fire about ten minutes and strain through cheese cloth. Add more water after straining, if necessary, to develop a meaty flavor. Reheat and serve.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4¾ oz.)...	2	13	9	24

OATMEAL SOUP (C)

1½ c. dry oatmeal
⅓ tbsp. butter
1 pt. water
1 tsp. salt

Cook all ingredients together and rub through sieve. Add water to make thin gruel.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4¾ oz.)...	6	33	36	75

CREAM OF OKRA SOUP (B-C)

1 can okra
½ c. strained tomatoes or 2 tbsp. condensed tomatoes
⅔ c. cream
1 c. water
1 tsp. grated onion
4 tsp. savora extract

Cook tomato, onion, water and savora about ten minutes, then add okra, heat, and press through a fine sieve. Add scalded cream just before serving.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4¾ oz.)...	24	50	18	92

OKRA SOUP (B-C)

2 cups cooked okra
2 cups water
2 teaspoons grated onion
2 tablespoons savora
1½ cups strained tomato

Rub the okra through a colander. Heat with the other ingredients, and serve. Three tablespoons Japanese Soy, may be used instead of the savora.

	Protein	Fats	Carbohydrate	Total
Calories in a serving (4¾ oz.)...	2	1	9	12

CREAM OF BROWN ONION SOUP (B-C)

4 medium-sized onions
1½ c. cream
1 tbsp. gluten flour
1 tsp. salt
1½ c. water
½ tsp. savora

Cook onions until tender and until liquid becomes thick. Rub through a colander, add the liquid and thicken with the flour. Add salt. Let boil five minutes.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4¾ oz.)...	6	77	18	101

POTATO SOUP (For Potato Day) (C)

1 small baked potato
1 c. water
Onion salt
½ tbsp. butter
¼ tsp. salt
¼ tsp. savora extract

Mash the potato, add the butter, salt, onion salt, savora and water. Heat to boiling.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4¾ oz.)...	3	27	20	50

SAVORA BROTH (A-F-V)

4 tsp. savora extract
1 qt. water

Heat water, add savora extract and bring to boiling.

SPINACH BROTH (A-F-V)

3 qts. water
2 qts. spinach
1 tsp. savory salt

Parboil the spinach by bringing to the boiling point, drain off the water and cover again with fresh water. Cook 15 to 20 minutes, drain and use water for broth. Add salt just before serving.

Calories per serving, 4¾ oz.

CREAM OF SPINACH SOUP (B-C)

1 c. spinach purée
1 tsp. salt
2 c. cream
3 c. water
¼ tsp. savora extract

Heat the cream in a double boiler. Add the spinach purée, savora and salt. Mix well and serve very hot.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4¾ oz.)...	4	75	10	89

PROTOSE SOUP (C)

1 oz. protose
2½ c. water
1 tbsp. butter
½ tsp. celery salt
1 egg yolk
1 tsp. savora extract

Cook protose in water half an hour, add savora, celery salt, and strain. Beat egg and pour hot liquid over it and add butter just before serving.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4¾ oz.)...	7	68	2	77

TOMATO BROTH (A-F-V)

1 c. condensed tomato
3 c. water
1 tsp. salt
½ tsp. savora extract

Mix in order given, keep hot in double boiler.

If canned tomatoes are used, take 3 cups tomatoes and 1 cup water. Put the tomatoes through a colander.

Calories for serving, 4¾ oz.

CREAM OF TOMATO SOUP (B-C)

1½ c. condensed tomatoes (or 1 pt. strained tomatoes) and ½ c. water added to condensed tomatoes
1 pt. cream
1 tsp. salt
Pinch of baking soda
½ tsp. savora extract

Heat tomato and water to boiling point, and add soda. Pour tomato slowly into scalded cream. When combining tomato and cream, remove both from fire to keep from curdling. Add salt and savora and serve.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4¾ oz.)...	15	126	32	173

TOMATO SOUP (A-F-V)

1 can tomatoes
1 bay leaf
1 tbsp. butter
1 pt. water
2 tsp. salt
2 slices onion
½ tsp. savora extract

Cook all the ingredients except butter for twenty minutes. Strain. Add butter just before serving.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4¾ oz.)...	17	37	11	65

CREAM OF VEGETABLE OYSTER SOUP (B-C)

1½ c. vegetable oysters
1 tsp. salt
3 c. cream
1½ tsp. savora extract

Thrice cook the vegetable oysters and force one-half the amount thru a colander; dice the remainder. Scald the cream and to this add the vegetable purée with the diced vegetable. Add seasonings and serve.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4¾ oz.)...	9	155	18	182

Entrees

ASPARAGUS LOAF (B-C)

½ oz. 80% gluten biscuit
1 egg
1 tbsp. butter
1 c. hot cream
2 c. asparagus
1 tsp. salt

Roll the biscuit, add hot cream, butter, salt, beaten eggs and lastly fold in the asparagus. Bake in a moderate oven.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4¾ oz.)...	13	81	9	103

EGG TIMBALES (B-C)

⅔ c. cream
3 eggs
Celery salt
1 tbsp. chopped celery
½ tsp. salt

To cream and seasonings add egg yolks beaten until lemon colored. To this mixture add egg whites beaten until stiff and dry. Turn into buttered ramekins and set in a pan of hot water. Bake in a slow oven until firm (about one-half hour).

	Protein	Fats	Carbohydrate	Total
Calories per serving (4¾ oz.)...	28	119	8	155

ESCALLOPED EGGS (B-C)

3 egg yolks (hard boiled)
2 tbsp. gluten crumbs
(80%)
1 tbsp. olives chopped
½ tsp. salt
1 tsp. butter
Few drops onion juice

Crumb 80% gluten sticks. Cook eggs for 30 minutes and put yolks through a colander. Put a layer of crumbs in the bottom of a buttered dish, then a layer of egg yolks, and on top of this a layer of chopped olives. Add a little salt and a few drops of onion juice. Repeat until dish is full. Place crumbs and bits of butter on top. Put dish in pan of hot water and bake 15 or 20 minutes.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4¾ oz.)...	69	201	8	278

PEPPERS STUFFED WITH EGG AND CHEESE (B-C)

1 or 2 sweet green peppers,
parboiled
1 egg
½ green pepper (raw)
chopped
½ oz. cream
1 oz. yogurt cheese

Cut off small end of pepper, remove seeds and parboil 7 minutes. Press cheese through a colander and add to beaten egg and cream. Fill pepper, bake in a moderate oven until firm.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (4¾ oz.)...	44	147	6	197

CELERY AND CHEESE (B-C)

2 c. cooked celery	4 oz. yogurt cheese
1 c. cream	4 80% gluten biscuits

Cut celery into cubes and cook until tender. Arrange in a buttered baking dish with a layer of celery, a layer of cheese, making two layers of each. Add cream and spread gulten biscuit crumbs over top.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (4¾ oz.)...	22	106	11	139

BAKED EGGS IN CREAM (B-C-A)

1 egg	3 tbsp. cream

Break egg into buttered ramekin. Pour over it the cream and bake until firm.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (4¾ oz.)...	28	135	10	173

BAKED EGG IN TOMATO (B-C)

6 eggs	1 tbsp. tomato

Break the eggs into buttered ramekins. Sprinkle the eggs with salt and pour tomato over them. The tomato should cover the eggs. Set the dishes in hot water and bake slowly in a moderate oven until a desired degree of hardness is reached, which will take about ten minutes.

	Protein	Fats	Carbohydrate	Total
Calories per serving (2½ oz.)...	23	33	14	70

SPANISH EGGS (B)

6 eggs
2 tbsp. lemon juice
1½ tsp. onion juice
¾ c. strained tomato
3 doz. ripe olives chopped
¼ tsp. salt
¼ tsp. celery salt

Beat the eggs slightly and add the remaining ingredients. Cook in a double boiler, stirring meanwhile until thickened but not crumbly.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4¾ oz.)...	27	91	10	128

EGG OMELET (B)

⅛ tsp. salt
2 tbsp. hot water
2 eggs
½ tbsp. butter

Mix egg yolks, salt and hot water. Beat whites and fold in. Butter omelet pan and pour in mixture. Cook, turn, fold and serve immediately. Before folding to serve, put in oven for a short time.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4¼ oz.)...	46	135	0	181

GLUTEN EGG TOAST (C)

1 slice gluten bread
(toasted)
¼ c. cream
1 hard-cooked egg

Heat in double boiler and to this add the finely cut egg white. Pour this dressing over the hot toast. Grate the egg yolk on the top in a heap in the center, as a garnish.

	Protein	Fats	Carbohydrate	Total
Calories per serving (2½ oz.)...	43	61	26	130

TOMATO OMELET (B)

2 eggs
2 tbsp. cream
2 slices tomato

Beat eggs, add cream and salt and cook in hot omelet pan. Place tomato in center and fold over.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4¾ oz.)...	29	73	17	119

MUSHROOM OMELET (B)

2 eggs
2 tbsp. cream
Mushrooms
Salt
½ tsp. savora extract

Beat the eggs, add cream, savora extract and salt, cook in hot omelet pan. Place broiled mushrooms in center and fold over.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4 oz.).....	55	114	19	188

ALPINE EGG (B)

1½ squares yogurt cheese
1 egg
½ tsp. butter

Cover bottom of a buttered ramekin with part of the grated cheese. Break egg over this. Season with salt and butter. Cover with the rest of the grated cheese and chopped parsley. Place in a pan of hot water and bake until firm.

	Protein	Fats	Carbohydrate	Total
Calories per serving (2¼ oz.)...	38	111	3	152

ROSE EGG (A)

Separate the white from the yolk of one fresh egg, being careful not to break the yolk. Add a pinch of salt to white and beat until stiff. Arrange on toast (dipped in cream) by making a hollow in the center into which the yolk is dropped. Bake in a moderate oven until brown. Serve on the plate on which it was baked.

	Protein	Fats	Carbohydrate	Total
Calories per serving (1½ oz.)...	23	40	0	63

SCRAMBLED EGGS (A)

4 eggs
½ c. cream
½ teaspoon salt

Beat four eggs lightly, add the cream and salt. Turn into a double boiler and cook until thickened, stirring meanwhile.

	Protein	Fats	Carbohydrate	Total
Calories per serving (3½ oz.)...	47	104	3	154

BAKED TOMATO ON TOAST (C)

3 slices gluten bread
3 thick slices tomatoes
½ tbsp. butter
⅝ c. cream
Salt

Moisten toasted bread with the cream. Slice tomatoes and bake on oiled tin. Before placing in oven, sprinkle with salt and pour over a little melted butter. When baked, place a slice on each slice of toast.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (3 oz.).....	22	72	34	128

Vegetables

BUTTERED ARTICHOKES (A)

Artichokes	1 tbsp. butter

Dice artichokes, cook in three waters one-half hour each time. Dress with melted butter and serve.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (5 oz.).....	1	108	0	109

ASPARAGUS IN CREAM (B)

1 can asparagus tips	1 c. cream
	1 tsp. salt

If fresh asparagus is used, two bunches will yield the same amount as the can of asparagus. Cook fresh asparagus until tender or heat canned asparagus. Drain and add hot cream and salt.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (5 oz.).....	3	47	9	59

ASPARAGUS SOUFFLE (B)

1 egg	2 tbsp. cream
	½ c. asparagus purée

Add cream to the asparagus purée, then add the beaten yolk of egg. Fold in the stiffly beaten egg white and bake in buttered ramekins, placing ramekins in pan of hot water.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (3 oz.).....	14	59	7	80

STRING BEAN SOUFFLE (B)

1 egg	2 tbsp. cream
	½ c. string bean purée

Add cream and well beaten egg yolk to the bean purée. Fold in the stiffly beaten egg white and bake in buttered ramekins, placing ramekins in a pan of hot water.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (3 oz.).....	14	59	10	83

STRING BEANS (A)

1 c. string beans	1¼ c. water
⅛ tsp. salt	1 tsp. butter

String the beans, cut into inch lengths, wash, and cook in boiling water one to three hours. Salt the last half hour of cooking. Drain. Season with butter.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (5 oz.).....	0	18	4	22

BAKED CABBAGE (A)

1 head cabbage	2 eggs
	1 c. cream

Prepare cabbage by removing outside leaves and chopping, not too finely. Put to soak in cold water one-half hour or more. Boil until tender, drain and cool slightly. Add well-beaten eggs to the cream. Mix with the cabbage and bake until browned.

	Protein	Fats	Carbohydrate	Total
Calories per serving (3 oz.).....	10	65	9	84

BOILED CABBAGE (A)

Take off the outside leaves, cut in quarters, and remove tough stalks. Soak one-half hour in cold water. Cook in uncovered dish in boiling salt water until tender, drain, chop and season with salt.

	Protein	Fats	Carbohydrate	Total
Calories per serving (5 oz.).....	0	0	9	9

CABBAGE AND DRESSING (B)

2 c. celery
2 c. tomato
1 c. nuts
1 c. cucumber
8 tbsp. butter
5 tbsp. onion

Cook these ingredients in double boiler, until cucumber and celery are tender. Pour over steamed cabbage.

	Protein	Fats	Carbohydrate	Total
Calories per serving (5 oz.).....	7	105	17	129

CREAMED CARROTS (A)

3 c. diced carrots
¾ c. cream

The carrots should be cooked in three waters. The cream is then added in the proportion of 1 to 2.

	Protein	Fats	Carbohydrate	Total
Calories per serving (3 oz.).....	3	47	7	57

CARROT SOUFFLE (A)

1 egg
2 tbsp. cream
½ c. carrot purèe (carrots thrice cooked)

Add the cream and the well beaten egg yolk to carrot purée, fold in the stiffly beaten whites of eggs and bake in buttered ramekins, placing them in a pan of hot water.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (3 oz.).....	14	59	7	80

BUTTERED CAULIFLOWER (A)

2 tbsp. butter
1 tsp. salt
1 head cauliflower (uncooked)

Prepare cauliflower by removing outside leaves and breaking flowerets apart. Soak in salted water (2 tbsps. salt to 1 qt. of water) one-half hour. Then boil in salted water 15 min. or until tender. Drain and add the butter in bits on the cauliflower.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (5 oz.).....	0	73	14	87

CAULIFLOWER WITH EGG SAUCE (B)

1 head of cauliflower
½ c. egg sauce

Prepare and cook cauliflower the same as for buttered cauliflower. Serve hot with egg sauce.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (3 oz.).....	3	36	11	50

EGG SAUCE

1 pt. cream
1 tbsp. gluten flour
1 egg yolk

Rub flour smooth with a little of the cream. Heat the remainder of the cream and add flour. Allow this to boil for only a few minutes. Remove from the fire and add slowly the well beaten yolk. Place in a double boiler and cook until thickened.

	Protein	Fats	Carbohydrate	Total
Calories per serving (3 oz.).....	4	53	6	64

CAULIFLOWER IN CREAM (A)

1 head cauliflower
1 tsp. salt
½ c. cream

Prepare the cauliflower as for buttered cauliflower. Boil until tender. Add hot cream and salt and cook five minutes.

	Protein	Fats	Carbohydrate	Total
Calories per serving (5 oz.).....	3	53	17	73

STEAMED CAULIFLOWER (A)

Remove leaves, cut off stalk and soak thirty minutes, head down, in cold water. Cook head up in boiling salted water, until tender and drain. Separate flowerets, season with salt and serve.

	Protein	Fats	Carbohydrate	Total
Calories per serving (5 oz.).....	0	0	15	15

STEWED CELERY (A)

Clean, scrape, and dice celery, cook in boiling water until tender. Drain and season with salt.

	Protein	Fats	Carbohydrate	Total
Calories per serving (5 oz.).....	0	0	5	5

CREAMED CELERY (A)

2 c. celery
2 c. cream

Prepare and cook celery as for stewed celery. Drain and pour over it the hot cream.

	Protein	Fats	Carbohydrate	Total
Calories per serving (5 oz.).....	9	145	18	172

ESCALLOPED CELERY (B)

1 c. raw celery (chopped)
⅓ c. ripe olives (chopped)
½ c. gluten crumbs (80%)
½ tsp. salt
½ c. cream
1 tbsp. butter

Crumb 80% gluten sticks finely. Sprinkle a layer of the crumbs on the bottom of the dish, then a layer of the celery and a few pieces of the olives, and a little salt. Repeat until dish is full. On top sprinkle more crumbs and dot with bits of butter. Add cream, place dish in pan of hot water and bake 15 or 20 minutes in a moderate oven.

	Protein	Fats	Carbohydrate	Total
Calories per serving (3 oz.).....	11	104	11	126

LETTUCE AND CELERY STEW (A)

2 c. celery
2 onions
¼ c. cream
1 qt. lettuce
1 tsp. salt

Prepare and dice celery. Tear lettuce into small pieces. Steam both until tender. Add seasonings and serve.

	Protein	Fats	Carbohydrate	Total
Calories per serving (5 oz.).....	1	28	6	35

CELERY SOUFFLE (A)

1 egg
2 tbsp. cream
½ c. celery pulp or purée

Add cream and well beaten egg yolk to celery purée. Fold in the stiffly beaten egg white and bake in buttered ramekins, placing them in a pan of hot water.

	Protein	Fats	Carbohydrate	Total
Calories per serving (3 oz.).....	14	59	7	80

STUFFED CUCUMBER (A)

1 cucumber
Tomato
Salt
Butter
Celery
½ onion
Green pepper

Pare cucumber, cut into halves lengthwise. Remove seed center, and fill with a filling made from celery, tomato, onion and 1⅓ tbsp. butter. Baste with 2 tbsp. of butter and bake until tender.

	Protein	Fats	Carbohydrate	Total
Calories per serving (3 oz.).....	1	102	7	110

BROILED MUSHROOMS (B)

Wash mushrooms, peel the stems and caps. Place them in a buttered broiler and broil five minutes with cap side down (at first) and then turn. When serving, leave cap-side up, season with a little salt, butter and savora placed in each cap. If using canned mushrooms, broil and serve in same way.

	Protein	Fats	Carbohydrate	Total
Calories per serving (5¼ oz.)...	20	59	39	118

CREAMED MUSHROOMS (B)

1 c. mushrooms ¾ c. cream
½ tsp. salt

Heat cream and add mushrooms. Salt and serve.

	Protein	Fats	Carbohydrate	Total
Calories per serving (3 oz.).....	10	73	19	102

DUCHESS ONIONS (B)

3 cooked onions 2 tbsp. yogurt cheese
1 tbsp. butter

Peel the onions under water and cook uncovered in three different waters. Force cheese through a colander. Heat butter in a double boiler, add cheese and onions and heat together. Serve with olives.

	Protein	Fats	Carbohydrate	Total
Calories per serving (6 oz.).....	21	192	26	239

OKRA AND TOMATO STEW (A)

1 qt. okra 6 large tomatoes or
1 tbsp. butter 1 pt. canned

Cut okra into thin slices. Peel tomatoes and cut into small pieces. Salt and cook 30 minutes, then add butter and serve.

	Protein	Fats	Carbohydrate	Total
Calories per serving (5 oz.).....	8	21	34	63

BAKED ONIONS (A)

3 medium-sized onions ½ tbsp. butter
⅛ tsp. salt

Steam or boil the onions. Sprinkle with salt and brush with the melted butter. Place in oven and bake until somewhat brown.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (4¼ oz.)...	0	54	4	58

BAKED ONIONS AND DRESSING (B)

5½ lbs. raw peeled onions
½ c. chopped celery
½ c. chopped cucumber
7 c. hot water
½ c. condensed tomato
1 tsp. salt
2 tbsp. butter

Make a dressing with the celery, tomato, cucumber and melted butter. Pour over the onions, add the hot water and salt and bake 2 hours in a covered pan or dish.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (5 oz.).....	1	43	4	48

ONION SOUFFLE (A)

1 egg
2 tbsp. cream
½ c. onion

Add cream and well beaten egg yolk to onion purée. Fold in the stiffly beaten egg white and bake in buttered ramekins placing them in a pan of hot water.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (3 oz.).....	14	60	15	89

SPINACH SOUFFLE (A)

1 egg
2 tbsp. cream
½ c. spinach

Add cream and well beaten egg yolk to spinach purée. Fold in the stiffly beaten egg whites and bake in buttered ramekins, placing them in a pan of hot water.

	Protein	Fats	Carbohydrate	Total
Calories per serving (3 oz.).....	14	59	9	82

SPINACH (A)

1 peck spinach

1 qt. water

Put spinach to cook in boiling water and let boil for about five minutes. Drain off the water and continue cooking in double boiler in its own juice for a half hour or until tender. Salt and serve hot with lemon juice if desired.

	Protein	Fats	Carbohydrate	Total
Calories per serving (5 oz.).....	0	0	10	10

PARSNIPS SOUFFLE (A)

1 egg

2 tbsp. cream

½ c. parsnips purée (thrice cooked)

Add cream and well beaten yolk of egg to parsnip purée. Fold in the stiffly beaten white of egg and bake in buttered ramekins, placing ramekins in a pan of hot water.

	Protein	Fats	Carbohydrate	Total
Calories per serving (3 oz.).....	14	59	9	82

SPINACH ON TOAST (B)

¼ c. spinach (scant)
⅛ tsp. salt
2 tbsp. cream
½ tsp. butter
1 slice gluten bread toasted
1 slice hard-boiled egg

Heat the spinach, season with salt and butter; toast the bread and moisten in the milk and cream. Place the spinach on the toast and garnish with a slice of hard-boiled egg.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (4½ oz.)...	28	96	35	159

TOMATOES AU GRATIN (A)

Place layer of fresh sliced tomatoes in the bottom of a buttered pan. Then put on a layer of yogurt cheese, and a layer of crumbs on top. Dot with butter, sprinkle with salt and bake. Individual ramekins may be used.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (3 oz.).....	28	45	7	81

PALM CABBAGE (B-C)

Prepare palm cabbage by removing stalks from the can and washing thoroughly. The cabbage may be cubed, chopped or served in three inch lengths. Steam the cabbage only until well heated and serve with lemon.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (6 oz.)......	15	12	24	51

Note: Palm cabbage is the heart of the cabbage palm which grows in various tropical countries.

VEGETABLE OYSTER SOUFFLE (A)

1 egg
2 tbsp. cream
½ c. vegetable oyster purée

Add cream and well beaten yolk of egg to the vegetable oyster purée. Fold in the stiffly beaten white of egg and bake in buttered ramekins, placing ramekins in hot water.

	Protein	Fats	Carbohydrate	Total
Calories per serving (3 oz.).....	14	60	16	90

CREAMED VEGETABLE OYSTERS (A)

1 c. vegetable oysters
1½ c. cream

Select large, firm, vegetable oysters and scrape. Put at once into cold water to which has been added a spoonful of flour to prevent discoloration. Cook three times in salted water. Drain and serve with hot cream.

	Protein	Fats	Carbohydrate	Total
Calories per serving (3 oz.).....	3	47	15	65

Breads

GLUTEN BRAN BREAD (B)

4 eggs
1 c. yogurt buttermilk
1 c. walnuts
1 c. gluten flour
2 c. bran
1 tsp. butter
1 tsp. soda
½ tsp. salt

Beat eggs, add yogurt, nuts, flour, bran, soda, salt and butter. Mix and bake in loaf pan in moderate oven forty minutes.

	Protein	Fats	Carbohydrate	Total
Calories per serving (2 oz.).....	40	105	32	177

GLUTEN GRIDDLE CAKES (B)

1 egg
1 c. yogurt buttermilk
¾ tsp. soda
½ c. (heaped) gluten flour

Beat egg, add yogurt, salt, flour, sifted with soda.

	Protein	Fats	Carbohydrate	Total
Calories per serving (2½ oz.)...	51	22	50	123

40% GLUTEN PUFFS (B)

1 c. cream
1 tsp. salt
½ tsp. soda
1 egg
1¼ c. 40% gluten flour
40 minims hydrochloric acid

This amount of soda and hydrochloric acid is equivalent to 2 tsp. of baking powder.

Beat egg until light; add salt, cream and beat again. Sift the flour and soda together into the other ingredients, and stir thoroughly. Lastly add the hydrochloric acid and stir it in quickly. Drop the batter by spoonfuls into a baking pan and bake in a hot oven for 15 min. Gem pans may be used if preferred. Serve 2 biscuits.

	Protein	Fats	Carbohydrate	Total
Calories per serving (2 oz.).....	46	72	49	167

DIABETIC BRAN GEMS (B)

1 egg
2½ c. bran
1 c. yogurt buttermilk
¾ tsp. soda

Beat egg, add yogurt, soda, salt and bran. Mix well and pack into well greased iron gem pans. If this crumbly mixture is not well packed into the pans, it is difficult to remove the gems whole. Bake in a moderate oven three quarters to one hour or until gems are firm.

	Protein	Fats	Carbohydrate	Total
Calories per serving (2 oz.).....	10	19	5	34

GLUTEN BREAD (B)

1 pt. water (⅓ cream)
3¾ c. 40% gluten flour
1 yeast cake
1 tsp. salt

Put the yeast to soak in one-fourth cup additional water. When sufficiently softened, add to one pint of warm water. If convenient to use one-third cream, scald the cream and add to the remaining ⅔ pint of warm water. Make a sponge by adding 1¾ c. of gluten flour and the salt, and set away to rise. When light and full of bubbles, add the remainder of the flour. Knead thoroughly, let rise until light then shape into a loaf. Place in a buttered bread tin, bake in a hot oven three-quarters of an hour to an hour.

	Protein	Fats	Carbohydrate	Total
Calories per serving (1 oz.).....	21.5	15	26	68.5

80% GLUTEN PUFFS (B)

½ c. 80% gluten meal
¼ tsp. soda
1 egg
⅓ c. water
20 min. hydrochloric acid

This amount of soda and hydrochloric acid is equivalent to 1 tsp. of baking powder.

Beat egg yolk, add water and sift flour with soda into the mixture. Pour hydrochloric acid into liquid beside flour. Fold in stiffly beaten whites of egg. Beat well and bake in hot buttered gem pans.

	Protein	Fats	Carbohydrate	Total
Calories per serving (2 oz.).....	70	15	9	94

ALMOND GEMS (B)

2 egg whites
½ c. almond meal
1 tsp. lemon juice

Beat egg whites stiffly, add lemon juice and meal. Mix carefully and do not beat. Bake like drop cookies on a greased tin in moderate oven.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (1 oz.).....	29	112	16	257

LETTUCE SANDWICH (B)

2 slices gluten bread	1 tbsp. butter
Lettuce	2 tsp. mayonnaise

(Cucumber or tomato may be used in place of lettuce)

Slice bread thinly, spread the butter, arrange lettuce on bread and spread with mayonnaise.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (2 oz.).....	24	44	33	101

COTTAGE CHEESE SANDWICH (B)

2 slices gluten bread	1 tbsp. butter
	Cottage cheese

Slice bread thinly, spread the butter lightly and then cottage cheese.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (3½ oz.)...	66	141	58	265

CUCUMBER SANDWICH (B)

2 slices gluten bread	1 tbsp. butter
6 thin slices cucumber	2 tsp. mayonnaise

Slice bread thinly, spread butter and place sliced cucumbers on slices, spread with mayonnaise and put together.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (3 oz.).....	46	59	61	166

Sauces

TOMATO SAUCE (B)

½ c. cooked tomatoes, strained
1 tsp. parsley
4 slices onion
2 tbsp. olive oil

Cook onions in oil until soft. Add tomatoes and simmer until well blended. Add parsley just before serving.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (1 oz.).....	1	52	6	59

HOLLANDAISE SAUCE (B)

½ c. butter
¼ tsp. salt
1 tbsp. lemon juice
2 egg yolks
⅓ c. boiling water

Divide butter in three pieces; put one piece in sauce pan with yolks of eggs and lemon juice, place sauce pan in larger one containing boiling water, and stir constantly with wire whisk until butter is melted; then add second piece of butter, and as it thickens, third piece. Add water, cook one minute and season with salt.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (1 oz.).....	2	107	0	109

Salads

CHEESE AND TOMATO SALAD (A)

Place a spoonful (heaping tbsp. or more) of cottage cheese on a lettuce leaf with a tsp. of raw mayonnaise on top. Peel a small ripe tomato and cut into four sections. Place the sections around the cheese with the cut edges up.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (4½ oz.)....	30	34	23	87

STRING BEAN SALAD (A)

1 can French beans
¼ c. French dressing

Drain the water from the beans. Pour over it the French dressing.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (3 oz.).....	0	73	6	79

STRING BEAN AND CUCUMBER SALAD (A)

2 c. string beans
1 c. diced cucumbers

Mix these ingredients and serve with oil dressing.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (3 oz.).....	0	54	5	59

CAULIFLOWER SALAD (A)

For each order serve 1 floweret of cauliflower, 1 tbsp. mayonnaise.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (3 oz.).....	3	29	12	44

CAULIFLOWER AND BEAN SALAD (A)

1 cup cauliflower
1 c. beans
½ c. celery
2 strips pimento
4 tbsp. French dressing

Prepare and cook cauliflower as for butter cauliflower. Separate flowerets. Mix with beans and celery. Pour French dressing over this mixture; arrange on lettuce leaf and garnish with pimiento.

	Protein	Fats	Carbohydrate	Total
Calories per serving (3 oz.).....	0	54	7	61

CHEESE AND LETTUCE SALAD (A)

1½ oz. lettuce hearts
1 oz. yogurt cheese (cubed)
1 oz. raw mayonnaise

Arrange cheese on lettuce hearts and put mayonnaise over cheese.

	Protein	Fats	Carbohydrate	Total
Calories per serving (3½ oz.)...	26	140	15	181

COMBINATION GREEN SALAD (A)

1 medium-sized tomato, peeled
¼ medium-sized cucumber, peeled
½ tsp. chopped sweet green peppers
1 radish
1½ tsp. French dressing

Slice the tomato on a lettuce leaf, then add sliced cucumbers and radishes and lastly sprinkle over the chopped pepper. Pour dressing on top.

	Protein	Fats	Carbohydrate	Total
Calories per serving (3 oz.).....	0	64	5	69

SLICED CUCUMBER (A)

2 oz. sliced cucumbers
1 tsp. lemon juice

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (3 oz.).....	2	2	10	14

CUCUMBER AND TOMATO SALAD (A)

1 tomato
1 lettuce leaf
½ tbsp. olive oil
1 cucumber
⅛ tsp. lemon
Salt

Remove interior of tomato, dice cucumbers and mix with dressing. Place this in tomato shell and serve on lettuce.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (3½ oz.)...	0	128	3	131

EGG MAYONNAISE SALAD (A)

½ oz. cooked mayonnaise. For each order serve 1 hard-boiled egg on a lettuce leaf with the dressing beside.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (3½ oz.)...	30	98	13	141

GOOD LUCK SALAD (A)

1 tbsp. raw mayonnaise
Sliced celery
3 tbsp. chopped nuts

Cut celery crosswise and arrange on lettuce leaf. Sprinkle with chopped nuts and serve with raw mayonnaise.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (2 oz.).....	12	110	15	137

EGG AND TOMATO SALAD (A)

1½ c. diced tomatoes
1½ c. diced celery
3 hard-boiled egg yolks
½ c. raw mayonnaise

Press the egg yolks through a colander and mix with tomato and celery. Arrange on lettuce and dot with mayonnaise.

	Protein	Fats	Carbohydrate	Total
Calories per serving (3 oz.).....	5	43	7	55

LETTUCE AND EGG SALAD (A)

2 lettuce leaves
2 tbsp. cooked mayonnaise
2 hard-cooked egg yolks
3 ripe olives

Place egg yolks and olives on lettuce leaves. Put mayonnaise beside them.

	Protein	Fats	Carbohydrate	Total
Calories per serving (3½ oz.)...	24	176	14	214

LETTUCE WITH LEMON (A)

1 oz. lettuce
¼ lemon or (⅛ oz. lemon juice)

Cut the lemon lengthwise and place 1 piece on a plate beside the lettuce.

	Protein	Fats	Carbohydrate	Total
Calories per serving (1⅛ oz.)...	0	0	1	1

NUT AND CELERY SALAD (B)

1 c. English walnuts
1 c. celery, chopped finely
¾ c. raw mayonnaise

Mix mayonnaise, celery and nuts. Serve 2 oz. of this mixture on 1 oz. head lettuce.

	Protein	Fats	Carbohydrate	Total
Calories per serving (2 oz.).....	15	132	18	165

NUT MACEDOINE SALAD (B)

2 c. celery
11 tsp. butter
⅓ c. onion
2 c. tomato
1 c. english walnuts
1 cucumber

Dice celery and cucumber, chop nuts finely and cut tomatoes. Pour over melted butter and serve on lettuce.

	Protein	Fats	Carbohydrate	Total
Calories per serving (3 oz.).....	7	118	9	134

NUT, CELERY AND OLIVE SALAD (B)

¾ c. chopped olives
1 c. celery
1 c. English walnuts
¾c. raw mayonnaise

Chop olives, nuts and celery fine and mix with mayonnaise. Serve on a bed of lettuce.

	Protein	Fats	Carbohydrate	Total
Calories per serving (2 oz.).....	11	134	16	161

DIABETIC PERFECTION SALAD (B)

¼ c. pimiento
1 c. celery
½ c. chopped nuts
½ tsp. salt
⅓ c. lemon juice
¾ c. cold water
¾ c. hot water
½ oz. or ⅔ box veg. gelatin

Chop pimientos, celery, nuts, add lemon juice and salt. Soak gelatin in cold water, drain and add to boiling water. Strain, and when cool add other ingredients. Turn into wet mold. Serve with raw mayonnaise.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (1¾ oz.)...	4	32	4	39

SALAD IN TOMATO CUPS (B)

6 tomatoes
1 c. celery
½ c. cucumbers
¼ c. English walnuts
1 c. mayonnaise

Cut off tops of tomatoes and remove pulp. Dice cucumbers, celery and tomato pulp and add English walnuts. Mix with mayonnaise. Fill shells with this.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (3 oz.).....	3	32	7	42

SUMMER SALAD (A)

Lettuce
¼ c. chopped celery
1 tbsp. grated radish
¼ c. cucumber diced
1 tbsp. grated onion
¼ c. cooked mayonnaise

Garnish a plate with lettuce and arrange the vegetables upon it. On top place 2 tbsp. of the dressing.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (3 oz.).....	7	76	15	98

TOMATO AND CAULIFLOWER SALAD (A)

1 tomato
1 tbsp. raw mayonnaise
Steamed cauliflower

Cut tomato in 6 or 8 pieces from top nearly to the bottom. Cut out a small circle in the center so that sections will stand out like petals, place cauliflower in center and put mayonnaise on top.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (3 oz.).....	1	14	7	22

TOMATO AND LETTUCE SALAD (A)

1 c. diced tomatoes
¾ c. shredded lettuce
¼ c. French dressing

Mix diced tomato and shredded lettuce and pour over them the French dressing. Serve on a bed of lettuce.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (3 oz.).....	0	93	4	97

FROZEN TOMATO SALAD (A)

6 tomatoes
1 tsp. salt
1 small green pepper chopped

Scoop out pulp of tomatoes, reserving the shells for cups, to serve the salad in. Press the pulp through a sieve and salt and freeze as an ice. Serve 1½ oz. of frozen mixture in cups and half ounce of raw mayonnaise on top of the mixture in cup. This mixture may be served on head lettuce with mayonnaise, discarding the cups.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (2 oz.).....	0	5	2	7

SWISS SALAD (A)

1 c. diced cucumbers
2 c. chopped celery
8 tbsp. butter
1 c. tomato
½ c. pimento
Salt to taste

Cut vegetables into small cubes and measure. Melt butter but do not overheat it. The butter should not be warm but just melted. Mix with vegetables and serve on lettuce leaf.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (3 oz.).....	0	84	2	86

WATER LILY SALAD (A)

2 hard-boiled eggs
1 tsp. lemon juice
1 tsp. butter
1-6 tsp. salt

Cut egg lengthwise. Remove yolks. Add to them butter, lemon and salt. Cut each half of the white lengthwise. Place these pieces on lettuce to represent petals of a lily. Take 1⅔ oz. of the yolk mixture, form into a ball and place in center of each lily.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (1½ oz.)...	31	70	1	102

ALLIGATOR PEAR SALAD (B-C)

Select and peel ripe avocadoes or alligator pears. Slice thinly and arrange on a bed of shredded lettuce, topped with raw mayonnaise.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (4 oz.)......	11	145	22	178

Desserts and Miscellaneous

FROZEN CREAM (A)

3 c. cream
Vanilla

Mix flavoring and cream and freeze.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (3¼ oz.)...	9	153	6	168

MINUTE BREW JELLY (A-F)

⅓ oz. gelatin
3 c. water
3 tbsp. minute brew

Pour boiling water over minute brew and add dissolved gelatin. Serve with cream and sugar.

BAKED CUSTARD (A)

1 egg
½ c. cream
½ c. water

Beat egg slightly; add cream and water and mix. Turn mixture into custard cups, set in pan of hot water while baking.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4½ oz.)...	17	115	10	142

EGG NOG (A)

1 egg
2 tbsp. cream

Beat yolk and white separately. Add cream to yolk and put beaten white on top.

	Protein	Fats	Carbohydrate	Total
Calories per serving (5 oz.).....	33	206	17	256

ORANGE YOGURT (A)

¼ c. orange juice
½ c. yogurt buttermilk

Strain orange juice and yogurt. Beat thoroughly.

	Protein	Fats	Carbohydrate	Total
Calories per serving (6 oz.).....	18	35	40	90

YOGURT BUTTERMILK (B-C)

1 pint skimmed milk 2 or 3 Yogurt tablets

Heat one pint of skimmed milk to boiling and continue boiling for five to ten minutes. Cover with a clean towel and cool to 110° or 115° F. Dissolve two or three Yogurt tablets in a little of the warm milk and add to the boiled milk. Set in a warm place (a little warmer than for bread), covered for 10 to 20 hours, or until it begins to coagulate. In the winter time it may be necessary to set in a pan of warm water 110° to 115° F. and cover. Renew the water every half hour or so. When coagulated, set in refrigerator.

The next day sterilize another pint of skimmed milk and cool to 110° or 115° F. Then add one-fourth cup of the previous batch, first having beaten it with an egg beater to break up the curd. Set in a warm place five to ten hours, or until coagulated, and put in the refrigerator. Beat just before serving. Repeat each day, using some of the previous day's batch as a starter. As the Yogurt grows older and more acid, use a little less of the starter. As it grows older it will also take less time to start it. It takes two or three days before a pleasant flavor is developed. Serve with one-fourth cream, if desired.

SUGAR-FREE MILK (B-C)

Dilute pure cream with three times its own volume of water. Mix well and let stand until the cream rises. Skim off the cream and repeat the above process three times. The final product will be practically free from carbohydrate.

	Protein	Fats	Carbo-hydrate	Total
Calories per serving (4 oz.)..........		200		200

40% GLUTEN MUSH (B)

1 c. gluten meal (40%) to 4 c. cream

Heat cream to boiling. Stir in meal slowly and cook over blaze until thickened; place in double boiler and cook one hour.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4¼ oz.)...	37	175	48	260

CREAM GLUTEN MUSH (B)

¾ c. 40% gluten meal
5 c. cream

Mix gluten with a little of the cold cream. Heat remainder of cream and add gluten mixture. Cook thoroughly.

	Protein	Fats	Carbohydrate	Total
Calories per serving (5 oz.).....	29	221	42	292

TOMATO JELLY (A)

2 c. tomato juice
1 large bay leaf
1 tsp. salt
⅓ c. lemon juice
1 small onion
⅛ oz. veg. gelatin
1 c. water

Cook tomato with bay leaf and onion ten minutes. Soak gelatin, drain and add to the cup of boiling water. Cook until clear, add to tomato juice. Strain and mold in ten punch glasses. Serve on 2 oz. head lettuce with 1 oz. raw mayonnaise.

	Protein	Fats	Carbohydrate	Total
Calories per serving (3 oz.).....	1	6	2	9

YOGURT JELLY (A)

1 c. yogurt milk
Juice and rind of three lemons
½ c. cream
½ c. vegetable gelatin (cooked)

Mix yogurt, lemon and cream together, add the prepared gelatin and pour into molds. Serve with mayonnaise.

	Protein	Fats	Carbohydrate	Total
Calories per serving (3 oz.).....	8	48	9	65

CEREAL COFFEE (A-V)

⅓ oz. veg. gelatin
3 c. water
3 tbsp. minute brew

Pour boiling water over the minute brew and add vegetable gelatin which has been prepared the same as for tomato jelly.

No food value.

GRAPE JELLY (A-V)

¼ oz. veg. gelatin
2⅓ c. boiling water
2 c. cold water
½ c. grape juice

Prepare vegetable gelatin according to general directions using 2⅓ cups boiling water for cooking the gelatin. Strain into the cold water and fruit juice. Pour into molds and set away to cool.

No food value.

CHERRY JELLY (B-C)

¼ oz. veg. gelatin
2⅓ c. hot water
2 c. cold water
¾ c. fresh cherry juice

Prepare vegetable gelatin according to general directions. Extract the cherry juice from fresh sour cherries by means of a fruit press. Strain the hot gelatin into the cold water and fruit juice. Pour into molds and set away to cool.

No food value.

SAVORA GELATIN (A-V)

¼ oz. veg. gelatin 2 c. cold water
2⅓ c. boiling water 3 tsp. savora extract

Prepare vegetable gelatin according to general directions using 1⅓ cups of boiling water for cooking the gelatin. In one cup of boiling water cook the savora extract for five minutes, and with the cold water add to the gelatin. Turn into molds and set away to cool.

No food value.

SAVORA BRAN GELATIN (B-C)

¼ oz. veg. gelatin 1 oz. mixed bran
2⅓ c. hot water 2 c. cold water
3 tsp. savora extract

Prepare vegetable gelatin according to general directions using 1⅓ cups of hot water for cooking the gelatin. In one cup of boiling water cook the savora extract for five minutes and with the cold water and bran add to the gelatin. This mixture must be stirred until nearly ready to solidify and then turned into molds and set away to cool.

	Protein	Fats	Carbohydrate	Total
Calories per serving (1½ oz.)...	1	4	6	11

TOMATO JELLY (B-C)

2 c. tomato juice 1 c. water
1 tsp. salt 1 large bay leaf
1 small onion ⅓ c. lemon juice
⅛ oz. veg. gelatin

Cook tomato with bay leaf and onion ten minutes. Soak gelatin and wash thoroughly. Cook in boiling water until clear and add to the tomato juice salt and lemon juice. Strain and mold in ten punch glasses.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4 oz.)....	10	7	31	48

RASPBERRY JELLY (B-C)

¼ oz. veg. gelatin
2⅓ c. hot water
2 c. cold water
¾ c. fresh red raspberry j

Prepare the vegetable gelatin according to general directions. Extract the juice from fresh red raspberries by means of a fruit press. Strain the hot gelatin into the cold water and fruit juice. Pour into molds and set away to cool.

No food value.

LEMON JELLY (A-V)

¼ oz. veg. gelatin
2⅓ c. boiling water
2 c. cold water
½ c. lemon juice

Prepare vegetable gelatin according to general directions, using 2⅓ cups boiling water for cooking the gelatin. Strain into the cold water and fruit juice. Pour into molds and set away to cool.

No food value.

YOGURT ICE CREAM (B-C)

3 c. yogurt buttermilk
¼ tsp. salt
1 c. water
½ c. grated orange rind
¼ c. lemon juice
5 c. cream
1 c. fresh pineapple juice
1 c. orange juice
1 c. grated fresh pineapple

Extract the juice from the fresh pineapple by means of a fruit press. Mix the juice with the buttermilk, water, fruit juices, orange rind, shredded pineapple and salt. Freeze slightly; add the cream and finish freezing.

	Protein	Fats	Carbohydrate	Total
Calories per serving (4 oz.)......	5	82	28	160

Caloric Value of Diabetic Dishes

SOUPS

Soups	Oz.	Calories per Serving				
		Protein	Fat	Carbohydrate	Total	Portion
Almond, Cream of	4¾	5	135	16	156	1½
Asparagus, Cream of	4¾	8	129	15	152	1½
Asparagus Broth	4¾					
Bean (Soja), Cream of	4¾	32	102	34	167	1¾
Bean (Soja) and Tomato	4¾	54	73	59	185	1¾
Cabbage Broth	4¾	4	29	9	42	...
Celery, Cream of	4¾	10	164	18	192	2
Crecy, Cream of	4¾	10	149	17	176	2¾
Lettuce, Cream of	4¾	7	107	11	125	1¼
Mushroom Broth	4¾	5	46	20	71	¾
Oatmeal Broth (Oatmeal Day)	4¾	10	36	38	82	¾
Okra, Cream of	4¾	25	49	18	91	1
Okra Broth	4¾					
Onion (Browned), Cream of	4¾	6	77	17	100	1
Pototo Soup (Potato Day)	4¾	3	27	20	50	½
Savora Broth	4¾					
Spinach Broth	4¾	..	...	..	...	...
Spinach, Cream of	4¾	4	75	10	89	1
Saniterrapin Soup	4¾	7	67	2	76	¾
Tomato Soup	4¾	17	37	11	65	¾
Tomato Broth	4¾	..	...	..	...	...
Tomato, Cream of	4¾	14	126	32	172	1¾
Vegetable Oyster, Cream of	4¾	10	162	23	195	2

VEGETABLES

Artichokes, Buttered	5	1	108	..	109	1
Asparagus in Cream	5	3	47	9	59	½
Asparagus Souffle	3	14	59	7	80	¾
Asparagus Tips	6	0	0	6	6	...
String Beans	5	2	19	8	28	¼
String Bean Souffle	3	14	59	10	83	¾
Cabbage, Baked	3	13	67	16	96	1
Cabbage and Dressing	5	7	105	17	129	1¼
Cabbage, Steamed	3	0	0	5	5	1-16
Cabbage, Stewed in Cream	5	11	82	29	120	1¼
Carrot Souffle	3	14	60	6	80	¾
Cauliflower, Buttered	5	0	73	14	87	¾
Cauliflower with Egg Sauce	3	5	37	10	52	½
Cauliflower in Cream	5	3	59	17	73	¾
Cauliflower, Steamed	5	0	0	15	15	¾

	Oz.	Protein	Fat	Carbohydrate	Total	Portion
Celery, Stewed	5	0	0	5	5	1-16
Celery, Creamed	5	10	146	22	178	1¾
Celery, Escalloped	3	13	105	14	132	1¼
Celery and Lettuce Stew	5	1	28	6	35	¼
Celery Souffle	3	16	60	12	87	¾
Cucumber, Stuffed	3	4	104	14	122	1¼
Mushrooms, Broiled	5¼	20	60	38	118	1¼
Mushrooms, Creamed	3	10	73	19	102	1
Okra and Tomato Stew	5	0	0	23	23	¼
Onions, Baked	4¼	0	54	4	58	¼
Onions, Baked, and Dressing	5	1	43	4	48	½
Onions, Duchess	6	20	191	27	239	2½
Onion Souffle	3	14	60	15	89	¾
Palm Cabbage	4	10	8	16	34	⅓
Parsnip Souffle	3	14	60	6	80	¾
Spinach Souffle	3	14	59	9	82	¾
Spinach on Toast	4½	28	96	35	159	1½
Tomatoes au Gratin	3	28	45	7	81	¾
Tomatoes with Peppers		1	60	15	65	¾

ENTREES

	Oz.	Protein	Fat	Carbohydrate	Total	Portion
Asparagus Loaf	3	13	81	9	103	1
Celery and Cheese	3	24	106	14	143	1½
Baked Eggs in Cream	3½	28	135	10	173	1¾
Baked Eggs in Tomato	2½	23	33	14	70	¾
Escalloped Eggs	2½	68	201	9	278	2¼
Spanish Eggs	3½	27	91	10	128	1¼
Gluten Egg Toast	2¼	44	61	26	130	1¼
Omelet	4½	46	135	..	181	1¾
Tomato Omelet	5	29	73	17	119	1¼
Mushroom Omelet	4	55	114	19	188	1¾
Egg Timbales	3	26	117	7	152	1½
Rose Egg	1½	22	40	..	62	¾
Scrambled Eggs	3½	47	104	3	154	1½
Peppers stuffed with Egg and Cheese	4	44	147	6	197	2
Baked Tomato on Toast	3	23	74	34	131	1¼
Welsh Rarebit	3	46	140	34	220	2¼
DESSERTS						
Frozen Cream	3¼	9	153	6	179	1¾
Baked Custard	4½	17	115	10	142	1½
BREADS						
Gluten Bran Bread	2	40	105	32	177	1¾
Gluten Cakes	1½	51	22	50	123	1¼
40% Gluten Puffs	2	46	72	49	167	1¾
80% Gluten Puffs	2	70	15	9	94	1
Gluten Bread	1	21	15	26	62	¾
Gluten Wafers	1	34	75	36	145	1½
Almond Wafers	1	29	112	16	156	1½
SAUCES AND GRAVIES						
Tomato Sauce	1	2	52	5	59	½
Hollandaise Sauce	1	2	106	1	109	1

Caloric Value of Diabetic Dishes

		Calories per Serving				
Salads	Oz.	Protein	Fat	Carbohydrate	Total	Portion
Beverages						
Orange Yogurt	6	18	35	40	93	1
Egg Nog	5	33	206	17	256	2½
Gluten Mush	4¼	37	175	48	260	2½
Beans, String	3	0	72	6	79	¾
Beans, String, and Cucumber	3	0	54	5	59	½
Beans, Soja	3	37	106	42	185	1¾
Cauliflower	3	3	29	12	44	½
Cauliflower and Bean	3	0	54	7	61	½
Cheese and Lettuce	3½	27	141	19	187	1¾
Combination Green	3	0	64	5	69	¾
Cucumbers, Sliced	3	0	0	3	3	¾
Egg Mayonnaise	2¼	30	98	13	141	1½
Good Luck Salad	1	7	55	8	70	¾
Egg and Tomato	3	5	43	7	55	½
Lettuce and Egg	3½	26	178	15	219	2¼
Lettuce and Lemon	1⅛	0	0	1	1	...
Nut and Celery	2	15	132	20	167	1¾
Nut Macedoine	3	7	118	9	134	1¼
Nut, Celery and Olive	2	12	134	17	163	1¾
Salad in Tomato Cups	3	3	32	7	42	½
Summer Salad	3	7	76	15	96	1
Rayol Salad	4	7	45	7	59	½
Tomato and Cauliflower	3	1	14	7	22	¼
Tomato Jelly	3	1	6	2	9	1-10
Tomato and Lettuce	3	0	93	4	97	1
Waterlily Salad	1½	31	70	1	102	1
Yogurt Jelly	3	9	48	8	62	¾

General Suggestions for Diabetic Patients

1. Cultivate self control. The pleasure of eating must be made altogether a secondary consideration. The diabetic must eat scientifically; he must "eat to live." Every meal must be carefully arranged with reference to health requirements.

2. The diet must be meager. Over-indulgence in eating is positively dangerous for a diabetic. Eat too little rather than too much.

3. A gain in flesh is not desirable except in cases of very decided emaciation. Persons who are obese must expect to lose in flesh and must reduce their weight to the normal standard as shown by the table on page 76 or a little less.

4. The basis of the diet should always be bulky green vegetables. The appetite may be satisfied with bulk even though the actual amount of food, as estimated in calories, may be comparatively small.

5. The diet should be sufficiently laxative to secure three bowel movements daily. Bran or agar-agar and paraffin oil should be taken in connection with every meal.

6. Generally every morsel should be thoroughly chewed. To this end it is well to take the food in as dry a form as possible. This is especially true of cereals. If bread is eaten it should be in the form of hard dry bread or toast. In cases of hyperacidity the food should be chewed less.

7. Cane sugar, honey and all other sweets must be strictly avoided.

8. Breakfast foods, bread and potatoes must be eaten very sparingly and in weighed quantities so that

the effect upon the sugar elimination may be accurately known.

9. Flesh meats of all kinds should be excluded from the bill of fare.

10. Eggs may be used sparingly. The yolks of eggs are better than the whites.

11. In some cases buttermilk may be taken in moderation without injury. As a rule, however, cream should be used in preference to milk as it contains less sugar. "Sugar-free milk" is best.

12. Ordinary dairy butter is objectionable on account of the considerable amount of butyric acid which it usually contains. This may be in large part removed by thorough washing. Sterilized butter is preferable.

13. Some fresh uncooked foods, such as lettuce, celery or cabbage, should be eaten at every meal. It is well to make large use of these green stuffs. Uncooked foods contain a large store of vitamines which are essential to health. Grapefruit and sour apples may be used for the same purpose in moderate amount.

14. When oatmeal and other cereals are eaten, the grains should be cooked only four or five minutes. This preserves the vitamines and also supplies a certain amount of raw starch which is beneficial.

15. Avoid the use of saccharine and drugs of all sorts. Saccharine is a poison and produces ill effects if taken in other than most minute quantities. There is reason to believe that even minute quantities used during a considerable length of time produce injury. The appetite for sweets should be overcome. It is possible for one who is fond of sweets to acquire by training an actual dislike for them and a liking for many delicate flavors he has never noted before, because they were hidden by sweets.

16. Once a week or at least once in two weeks the diet should be made to consist for a day or two exclusively of green vegetables. This helps to keep the urine free from sugar and to increase the tolerance for carbohydrates.

17. Whenever sugar appears in the urine an immediate change in the dietary must be made. Either a green diet or fasting should be resorted to until the urine is free from sugar and then the amount of food and carbohydrates should be again gradually increased until the limit of tolerance is reached.

18. In cases in which there is a strong tendency to acidosis, great care must be used to avoid excess of fat. Orange juice is highly useful in such cases.

19. Tea and coffee must be avoided; also alcoholic liquors as well as the use of tobacco and all other narcotics.

20. Water should be taken in sufficient quantity to satisfy thirst. One or two glasses may be taken at meal time without injury. A glassful should be taken on arising in the morning, on going to bed at night, and whenever the bladder is evacuated.

21. All foods must be carefully weighed or measured and the amount for each day recorded.

22. The amount of food (calories) found to be suited to a case must be carefully adhered to or increased gradually under expert advice.

Index

Acetone 12
Acidosis 34
Alligator Pear Salad 155
Almonds 63
Almond Gems 145
Alpine Eggs 130
Anesthesia 102
Artichokes, Buttered 132
Asparagus 66
Asparagus Broth 119
Asparagus in Cream 132
Asparagus Loaf 126
Asparagus Souffle 132

Baked Cabbage 133
Baked Custard 156
Baked Eggs in Cream 128
Baked Egg in Tomato 128
Baked Onions 139
Baked Onions and Dressing 140
Baked Tomato on Toast 131
Bamboo Shoots 66
Banana, etc. 67
Base Ration 39
Beans 65
Beans, String 133
Beech Nuts 63
Beta Oxybutyric Acid 12
Bill of Fare 68
Bills of Fare, Standard 77
Blood Pressure 100
Boiled Cabbage 134
Bouillon, Nut 121
Brazil Nuts 63
Breads 143
Bread, Gluten 145
Bread, Gluten Bran 143
Bright's Disease 101
Broiled Mushrooms 138
Broth, Asparagus 119
Broth, Mushroom 121

Broth, Savora.. 123
Broth, Spinach.. 124
Broth, Tomato.. 125
Buttered Cauliflower.. 135
Buttered Artichokes.. 132
Buttermilk, Yogurt.. 157
Butternuts 63

Cabbage 66
Cabbage, Baked.. 133
Cabbage, Boiled.. 134
Cabbage Broth.. 120
Cabbage and Dressing.. 134
Cabbage, Palm.. 142
Calories 69
Capsule Test.. 50
Carbohydrates 81, 82
Carbohydrate Tolerance.. 57
Carrots, Creamed.. 134
Carrot Souffle.. 135
Cauliflower 66
Cauliflower and Bean Salad.. 149
Cauliflower, Buttered.. 135
Cauliflower in Cream.. 136
Cauliflower with Egg Sauce.. 135
Cauliflower Salad.. 148
Cauliflower, Steamed.. 136
Celery 66
Celery and Cheese.. 128
Celery, Creamed.. 137
Celery, Escalloped.. 137
Celery Souffle.. 138
Celery, Stewed.. 136
Cereal Coffee.. 159
Cheese and Lettuce Salad.. 149
Cheese and Tomato Salad.. 148
Cherry Jelly.. 159
Coefficient of Sugar Utilization.. 31
Coffee, Cereal.. 159
Combination Green Salad.. 149
Constipation 106
Cottage Cheese Sandwich.. 146
Cream, Frozen.. 155

Cream Gluten Mush............................ 158
Cream of Almond Soup.......................... 119
Cream of Asparagus Soup........................ 119
Cream of Brown Onion Soup.................... 123
Cream of Celery Soup.......................... 120
Cream of Crecy Soup........................... 120
Cream of Lettuce Soup.......................... 121
Cream of Okra Soup............................ 122
Cream of Spinach Soup......................... 124
Cream of String Bean Soup.................... 119
Cream of Tomato Soup.......................... 125
Cream of Vegetable Oyster Soup................. 126
Creamed Carrots............................... 134
Creamed Celery................................ 137
Creamed Mushrooms............................. 139
Creamed Vegetable Oysters..................... 143
Cucumber and Tomato Salad.................... 150
Cucumber, Stuffed.............................. 138
Cucumber Sandwich............................. 146
Cucumber, Sliced............................... 150
Custard, Baked................................. 156

Days Ration.................................... 10
Desserts 155
Diabetes, Cause of............................. 16
Diabetes, Curability........................... 18
Diabetes, Methods of Study.................... 27
Diabetes, Nature of............................ 12
Diabetes, New Method.......................... 24
Diabetes, New Method of Treating............... 19
Diabetes, What is it?.......................... 9
Diabetic Bran Gems............................ 144
Diabetic Coma.................................. 103
Diabetic Dishes, Values of.....................162-164
Diabetic Perfection Salad...................... 152
Diacetic Acid.................................. 12
Duchess Onions................................. 139

Egg Alpine..................................... 130
Egg and Tomato Salad.......................... 151
Eggs Baked in Cream........................... 128
Eggs Baked, in Tomato......................... 128
Eggs Escalloped................................ 127

Egg Mayonnaise Salad........................... 150
Egg-Nog 156
Egg Omelet...................................... 129
Egg Plant....................................... 66
Egg, Rose....................................... 131
Egg Sauce....................................... 135
Eggs, Scrambled................................. 131
Eggs, Spanish................................... 129
Egg Timbales.................................... 126
Energy Balance.................................. 38
Entrees 126
Escalloped Celery............................... 137
Escalloped Eggs................................. 127
Exercise 87
Exercise, Automatic............................. 95

Fasting 24, 53
Fat as Fuel..................................... 11
Filberts 63
Frozen Cream.................................... 155
Frozen Tomato Salad............................. 154

Gangrene 109
Gelatin, Savora................................. 160
Gelatin, Savora Bran............................ 160
Gems, Almond.................................... 145
Gems, Diabetic Bran............................. 144
Gluten Bran Bread............................... 143
Gluten Bread.................................... 145
Glucose Nitrogen Ratio.......................... 47
Gluten Egg Toast................................ 129
Gluten Griddle Cakes............................ 143
Gluten Puffs, 80%............................... 145
Gluten Puffs, 40%............................... 144
Gluten Mush, 40%................................ 158
Glycogen 13
Good Luck Salad................................. 150
Graduated Feeding............................... 57
Grape Jelly..................................... 66
Green Vegetable Days............................ 85
Green Vegetables................................ 65
Griddle Cakes, Gluten........................... 143
Guelpa, Discovery by............................ 25

Health Rules.................................. 84
Hickory Nuts.................................. 63
Hollandaise Sauce.............................. 147
Hydrotherapy 97
Hyperglycemia 33

Ice Cream, Yogurt.............................. 161

Jelly, Cherry.................................. 159
Jelly, Grape................................... 159
Jelly, Lemon.................................. 161
Jelly, Minute Brew............................. 156
Jelly, Raspberry............................... 161
Jelly, Tomato..............................158, 160
Jelly, Yogurt.................................. 158

Lanolin Cream................................. 99
Legumes 64
Lemon Jelly................................... 161
Lentils 65
Lettuce 66
Lettuce and Celery Stew........................ 137
Lettuce and Egg Salad.......................... 151
Lettuce Sandwich.............................. 146
Lettuce with Lemon............................ 151
Light Baths................................... 98
Lily Flower.................................... 66
Lily Root..................................... 66

Meat Diet Danger.............................. 60
Metabolism Graphic............................ 28
Metabolism, Increase of........................ 44
Milk, Sugar Free............................... 157
Minute Brew Jelly.............................. 156
Mush, Cream Gluten........................... 158
Mush 40% Gluten.............................. 158
Mushroom, Broiled............................. 138
Mushroom Broth............................... 121
Mushrooms, Creamed........................... 139
Mushroom Omelet.............................. 130

Nuts 63
Nut and Celery Salad........................... 151

Nut Bouillon.................................... 121
Nut, Celery and Olive Salad.................... 152
Nut Macedoine Salad............................ 152

Oatmeal 59
Oatmeal Soup................................... 122
Okra Soup...................................... 123
Okra and Tomato Stew........................... 139
Omelet, Mushroom............................... 130
Omelet, Tomato................................. 130
Onions, Baked.................................. 139
Onion, Baked and Dressing...................... 140
Onions Duchess................................. 139
Onion Souffle.................................. 140
Orange, etc..................................... 68
Orange Yogurt.................................. 156
Oysters, Creamed Vegetable..................... 143

Palm Cabbage..............................66, 142
Parsnips Souffle............................... 141
Peas 65
Pecans, Pine Nuts, English Walnuts, Peanuts, Ripe Olives 63
Peppers Stuffed with Egg and Cheese............ 127
Posture 96
Potato Soup.................................... 123
Protein as Fuel................................. 11
Protein Ration.................................. 60
Protein, Vegetable.............................. 62
Protose Soup................................... 124
Puffs, 40% Gluten.............................. 144
Puffs, 80% Gluten.............................. 145

Raspberry Jelly................................ 161
Ration, Low Protein............................. 60
Respiratory Quotient............................ 48
Rose Egg....................................... 131

Salads 148
  Alligator Pear............................... 155
  Cauliflower 148
  Cauliflower and Bean......................... 149
  Cheese and Lettuce........................... 149

    Cheese and Tomato 148
    Combination Green 149
    Cucumber and Tomato 150
    Diabetic Perfection 152
    Egg Mayonnaise 150
    Egg and Tomato 151
    Frozen Tomato 154
    Good Luck 150
    Lettuce and Egg 151
    Nut and Celery 151
    Nut, Celery and Olive 152
    Nut Macedoine 152
    Salad in Tomato Cups 153
    String Bean 148
    String Bean and Cucumber 148
    Summer 153
    Swiss 154
    Tomato and Cauliflower 153
    Tomato and Lettuce 154
    Water Lily 155
Salsify 66
Sandwich, Cottage Cheese 146
Sandwich, Cucumber 146
Sandwich, Lettuce 146
Sauces 147
Sauce, Egg 135
Sauce, Hollandaise 147
Sauce, Tomato 147
Savora Bran Gelatin 160
Savora Broth 123
Savora Gelatin 160
Schedules 71
Scrambled Eggs 131
Skin Diseases 107
Sliced Cucumber 150
Souffle, Asparagus 132
Souffle, Carrot 135
Souffle, Celery 138
Souffle, Onion 140
Souffle, Parsnips 141
Souffle, Spinach 140
Souffle, String Bean 133
Souffle, Vegetable Oyster 142

Soups 119
  Almond, Cream of 119
  Asparagus, Cream of 119
  Brown Onion, Cream of 123
  Celery, Cream of 120
  Crecy, Cream of 120
  Lettuce, Cream of 121
  Oatmeal 122
  Okra 123
  Okra, Cream of 122
  Potato 123
  Protose 124
  Spinach, Cream of 124
  String Bean, Cream of 119
  Tomato 125
  Tomato, Cream of 125
  Vegetable Oyster, Cream of 126
Soy Beans 65
Spanish Eggs 129
Spinach 141
Spinach Broth 124
Spinach on Toast 141
Spinach Souffle 140
Starches 58
Steamed Cauliflower 136
Stew, Lettuce and Celery 137
Stew, Okra and Tomato 139
Stewed Celery 136
String Beans 66, 133
String Bean and Cucumber Salad 148
String Bean Salad 148
String Bean Souffle 133
Stuffed Cucumber 138
Sugar Free Milk 157
Sugar in the Blood 21
Sugar, Source of Energy 11
Summer Salad 153
Swiss Salad 154

Table of Weights 117
Tissue Balance 37
Tomatoes au Gratin 142
Tomato and Cauliflower Salad 153

Tomato and Lettuce Salad........................ 154
Tomato Baked, on Toast.......................... 131
Tomato Broth.................................... 125
Toast, Gluten Egg............................... 129
Tomato Jelly..............................158, 160
Tomato Sauce.................................... 147
Tomato Omelet................................... 130
Tomato Soup..................................... 125
Tuberculosis 102
Turnips 66

Urine, Testing of............................... 111

Vegetables 66, 132
Vegetable Oyster Souffle........................ 142
Vegetables, Extracted......................82, 83
Vegetables, Green............................... 65
Vegetable Proteins.............................. 62
Vegetarian Diet................................. 61
Vitamines 66

Water Balance................................... 43
Water Drinking.................................. 97
Water Lily Salad................................ 155
Weight, Standard................................ 75

Yogurt Buttermilk............................... 157
Yogurt Ice Cream................................ 161
Yogurt Jelly.................................... 158
Yogurt, Orange.................................. 156

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